NPort 5410/5430/5430I

User's Manual

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NPort 5410/5430/5430I
User's Manual

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1

Introduction

Welcome to MOXA NPort 5400 Series of advanced serial device servers that make it easy to network enable your serial devices. NPort 5410 comes with four RS-232 ports, and NPort 5430/5430I provide four RS-422/485 ports.

The following topics are covered in this chapter:

- **Overview**
- **Package Checklist**
- **Product Features**
- **Product Specifications**
- **Terminology and Acronyms**

Overview

NPort 5400 Series serial device servers are designed to make your industrial serial devices Internet ready instantly. The compact size of NPort 5400 device servers makes them the ideal choice for connecting your RS-232 (NPort 5410) or RS-422/485 (NPort 5430/5430I) serial devices—such as PLCs, meters, and sensors—to an IP-based Ethernet LAN, making it possible for your software to access serial devices anywhere over a local LAN or the Internet.

NPort 5400 serial device servers ensure the compatibility of network software that uses a standard network API (Winsock or BSD Sockets) by providing TCP Server Mode, TCP Client Mode, and UDP Mode. And thanks to NPort's Real COM/TTY drivers, software that works with COM/TTY ports can be set up to work over a TCP/IP network in no time. This excellent feature preserves your software investment and lets you enjoy the benefits of networking your serial devices instantly.

NPort 5400 serial device servers support automatic IP configuration protocols (DHCP, BOOTP) and manual configuration via NPort's handy web browser console. Both methods ensure quick and effective installation. And with NPort 5400's Windows Utility, installation is very straightforward, since all system parameters can be stored and then copied to other device servers simultaneously.

Package Checklist

MOXA NPort 5410/5430/5430I products are shipped with the following items:

Standard Accessories

- 1 NPort 5400 4-port serial device server
- NPort Document & Software CD
- NPort 5410/5430/5430I Quick Installation Guide
- Product Warranty Booklet

Optional Accessories

- DK-35A DIN-Rail Mounting Kit (35 mm)

NOTE: *Notify your sales representative if any of the above items is missing or damaged.*

Product Features

NPort 5400 Series products enjoy the following features:

- Make your serial devices Internet ready
- Easy-to-use LCM (Liquid Crystal Module) interface for setting up IP address
- Versatile socket operation modes, including TCP Server, TCP Client, and UDP
- Easy-to-use Windows Utility for mass installation
- Supports 10/100 Mbps Ethernet—auto detectable
- 2- or 4-wire RS-485 with patented ADDC™ (Automatic Data Direction Control) for NPort 5430/5430I
- Built-in 15 KV ESD protection for all serial signals
- Supports SNMP MIB-II for network management
- NPort 5430I has 2 KV isolation protection

Product Specifications

LAN

Ethernet	10/100 Mbps, RJ45
Protection	Built-in 1.5 KV magnetic isolation

NPort 5410 Serial Interface

Interface	RS-232
No. of Ports	4
Port Type	DB9 Male
Signals	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
Serial Line Protection	15 KV ESD for all signals 2 KV Isolation for NPort 5430I

NPort 5430 Serial Interface

Interface	RS-422/485
No. of Ports	4
Port Type	Terminal Block (5 pins per port)
Signals	RS-422: Tx+, Tx-, Rx+, Rx-, GND RS-485 (2-wire): Data+, Data-, GND RS-485 (4-wire): Tx+, Tx-, Rx+, Rx-, GND
Serial Line Protection	15 KV ESD for all signals
RS-485 Data Direction	ADDC™ (Automatic Data Direction Control)

Power Line Protection

4 KV Burst (EFT), EN61000-4-4

2 KV Surge, EN61000-4-5

Advanced Built-in Features

HMI	LCM display with four push buttons
Buzzer	
Real-Time Clock	
Watch Dog Timer	

Serial Communication Parameters

Parity	None, Even, Odd, Space, Mark
Data Bits	5, 6, 7, 8
Stop Bit	1, 1.5, 2
Flow Control	RTS/CTS (only for RS-232 port), XON/XOFF
Transmission Speed	50 bps to 230.4 Kbps

Software Features

Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, DNS, SNMP, HTTP, SMTP, SNTP
Utilities	NPort Administrator for Windows 95/98/ME/NT/2000/XP
Real COM/TTY Drivers	Windows 95/98/ME/NT/2000/XP COM driver, Linux real TTY driver
Configuration	Web Browser, Telnet Console, or Windows Utility

Power Requirements

Power Input	12 to 48 VDC
Power Consumption	NPort 5410: 385 mA (at 12V max.) NPort 5430: 380 mA (at 12V max.) NPort 5430I: 600 mA (at 12V max.)

Mechanical

Material	SECC sheet metal (0.8 mm)
Dimensions (W × H × D)	With mounting kit: 176 × 35.5 × 103 mm (6.93 × 1.4 × 4.06 inch) Without mounting kit: 158 × 33 × 103 mm (6.22 × 1.3 × 4.06 inch)
Gross Weight	NPort 5410: 0.5 kg (1.10 lb) NPort 5430, NPort 5430I: 0.5 kg (1.10 lb)
Installation	DIN-Rail, Wall Mounting

Environment

Operating Temperature	0 to 55°C (32 to 131°F), 5 to 95%RH
Storage Temperature	-20 to 85°C (-4 to 185°F), 5 to 95%RH

Regulatory Approvals

EMC	FCC Class A, CE Class A
Safety	UL, CUL, TÜV
WARRANTY	5 years

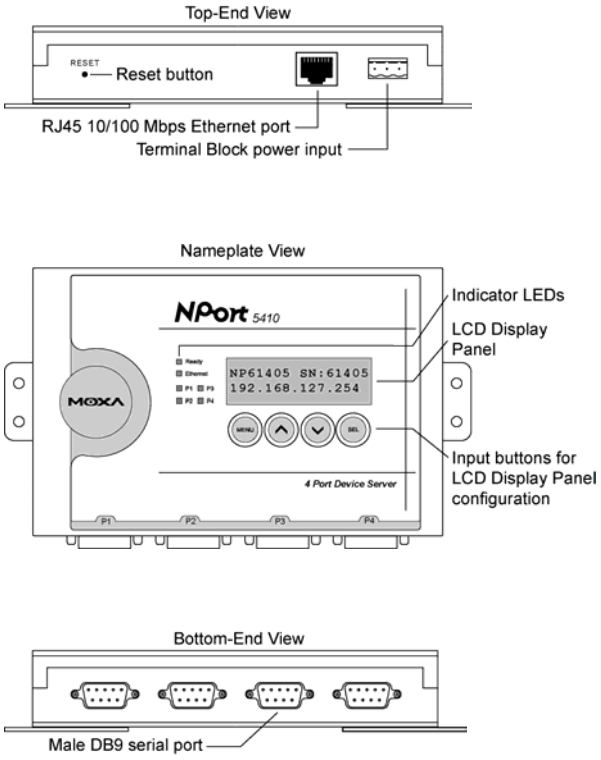
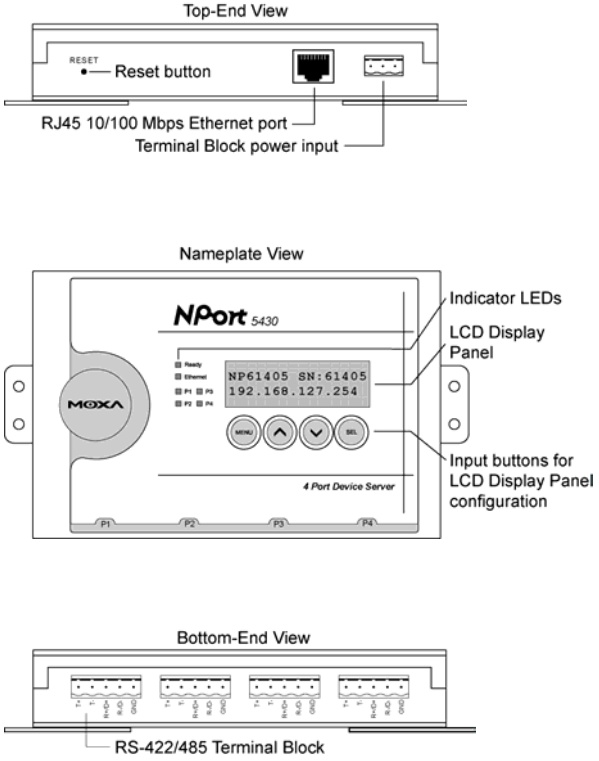
2

Getting Started

This chapter includes information about installing NPort 5410/5430/5430I. The following topics are covered:

- **Panel Layout**
- **Connecting the Hardware**
  - Wiring Requirements
  - Connecting the Power
  - Grounding NPort 5410/5430/5430I
  - Connecting to the Network
  - Connecting to a Serial Device
  - LED Indicators

Panel Layout

NPort 5410	NPort 5430/5430I
	

Connecting the Hardware

This section describes how to connect NPort 5410/5430/5430I to serial devices for first time testing purposes. We cover **Wiring Requirements**, **Connecting the Power**, **Grounding NPort 5410/5430/5430I**, **Connecting to the Network**, and **Connecting to a Serial Device**.

Wiring Requirements

ATTENTION

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your NPort 5410/5430/5430I.

Wiring Caution!

ATTENTION

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

ATTENTION

Temperature Caution!

Please take care when handling NPort 5410/5430/5430I. When plugged in, NPort 5420/5430/5430I's internal components generate heat, and consequently the casing may feel hot to the touch.

You should also pay attention to the following points:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

  NOTE: Do not run signal or communication wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.
- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- Where necessary, it is strongly advised that you label wiring to all devices in the system.

Connecting the Power

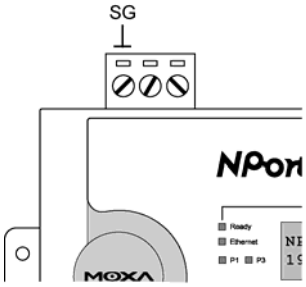
Connect the 12-48 VDC power line with NPort 5410/5430/5430I's terminal block. If the power is properly supplied, the "Ready" LED will show a solid red color until the system is ready, at which time the "Ready" LED will change to a green color.

Grounding NPort 5410/5430/5430I

Grounding and wire routing helps limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.

ATTENTION

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel.



SG: The *Shielded Ground* (sometimes called *Protected Ground*) contact is the left most contact of the 3-pin power terminal block connector when viewed from the angle shown here. Connect the SG wire to an appropriate grounded metal surface.

Connecting to the Network

Connect one end of the Ethernet cable to NPort 5410/5430/5430I's 10/100M Ethernet port and the other end of the cable to the Ethernet network. If the cable is properly connected, NPort 5410/5430/5430I will indicate a valid connection to the Ethernet in the following ways:

- The Link LED maintains a solid green color when connected to a 100 Mbps Ethernet network.
- The Link LED maintains a solid yellow color when connected to a 10 Mbps Ethernet network.
- The Link LED will flash when Ethernet packets are being transmitted or received.

Connecting to a Serial Device

Connect the serial data cable between NPort 5410/5430/5430I and the serial device.

LED Indicators

The top panels of NPort 5410/5430/5430I have four LED indicators, as described in the following table.

LED Name	LED Color	LED Function
Ready	red	Steady on: Power is on and NPort is booting up. Blinking: Indicates an IP conflict, or DHCP or BOOTP server did not respond properly.
	green	Steady on: Power is on and NPort is functioning normally. Blinking: The NPort has been located by NPort Administrator's Location function
	off	Power is off, or power error condition exists.
Link	orange	10 Mbps Ethernet connection.
	green	100 Mbps Ethernet connection.
	off	Ethernet cable is disconnected, or has a short.
P1, P2, P3, P4	orange	Serial port is receiving data.
	green	Serial port is transmitting data.
	off	No data is being transmitted or received through the serial port.

3

Initial IP Address Configuration

When setting up your NPort 5410/5430/5340I for the first time, the first thing you should do is configuring the IP address. This chapter introduces the method to configure NPort's IP address. ***Select one of the initial IP Address configuration methods to configure NPort's IP Address.*** For more details about network settings, see the ***Network Settings*** section from Chapter 5, ***Web Console Configuration.***

This chapter includes the following sections:

- **Initializing NPort's IP Address**
- **Factory Default IP Address**
- **LCM Display** ← ***recommended configuration method***
- **NPort Administration Suite** ← ***recommended configuration method***
- **ARP**
- **Telnet Console**

Initializing NPort's IP Address

1. Determine whether your NPort needs to use a Static IP or Dynamic IP (either DHCP or BOOTP application).
2. ***If NPort is used in a Static IP environment,*** you can use LCM Display, NPort Administration Suite, ARP, Web Console, or Telnet Console to configure the new IP address.
3. ***If NPort is used in a Dynamic IP environment,*** you can use LCM Display, NPort Administration suite, Web Console, or Telnet Console to configure NPort to get an IP address dynamically with DHCP, DHCP/BOOTP, or BOOTP.

Consult your network administrator on how to reserve a fixed IP address (for your NPort) in the MAC-IP mapping table when using a DHCP Server or BOOTP Server. In most applications, you should assign a fixed IP address to your NPort.

Factory Default IP Address

NPort products are configured with the following default private IP address:

Default IP address: 192.168.127.254

(IP addresses of the form 192.168.xxx.xxx are referred to as private IP addresses, since it is not possible to directly access a device configured with a private IP address from a public network. For example, you would not be able to ping such a device from an outside Internet connection. NPort applications that require sending data over a public network, such as the Internet, require setting up the server with a valid public IP address, which can be leased from a local ISP.)

LCM Display

We recommend using LCM display and four push buttons to configure the IP address at the first time installation.

Basic Operation

If the NPort is working properly, the LCM panel will display a green color. The red Ready LED will also light up, indicating that the NPort is receiving power. After the red Ready LED turns to green, you will see a display similar to:

N	P	6	1	4	0	5	_	6	1	4	0	5		
1	9	2	.	1	6	8	.	1	2	7	.	2	5	4

This is where

- NP61405 is the NPort's name
- 61405 is the NPort's serial number
- 192.168.127.254 is the NPort's IP address

There are four push buttons on NPort's nameplate. Going from left to right, the buttons are:

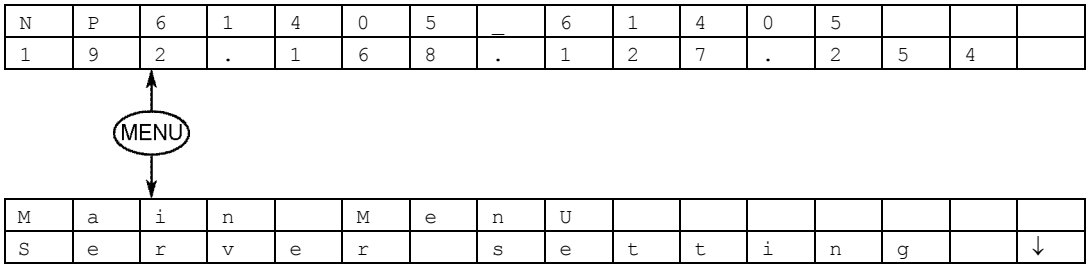
Button	Name	Action
MENU	menu	activates the main menu, or returns to a lower level
△	up cursor	scrolls up through a list of items shown on the LCM panel's second line
▽	down cursor	scrolls down through a list of items shown on the LCM panel's second line
SEL	select	selects the option listed on the LCM panel's second line

The buttons are manipulated in a manner similar to the way a modern cellular phone operates. As you move through the various functions and setting options, note that the top line shows the current menu or submenu name, and the bottom line shows the submenu name or menu item which is activated by pressing the sel button.

Detailed Menu Options

The best way to explain all of NPort's LCM functions is to refer to the tree graph shown in the next page. There are three main levels—1, 2, and 3—with each level represented by a separate column.

The first thing to remember is that the menu button is used to move back and forth between the LCM panel's default screen, and main menu screen:



In addition, you only need to remember to:

- Use the sel button to move up one level (i.e., left to right on the tree graph)
- Use the menu button to move down one level (i.e., right to left on the tree graph)
- Use the cursor keys, △ and ▽, to scroll between the various options within a level (i.e., up and down on the tree graph).

As you use the buttons to operate the LCM display, you will notice that with very few exceptions, moving up one level causes the bottom line of the display to move to the top line of the display. You will also notice that the bottom three options in level 2, and all of the options in level 3 have either a C or D attached.
The meaning is as follows:

- C = configurable
  I.e., you are allowed to change the setting of this option
- D = display only
  I.e., the setting for this option is displayed, but it cannot be changed (this does NOT necessarily mean that the number doesn't change; only that you can't change it)

Main Menu						
	Server setting	Serial number Server name Firmware ver Model name				*D* *C* *D* *D*
	Network setting	Ethernet status MAC address IP config IP address Netmask Gateway DNS server 1 DNS server 2				*D* *D* *C* *C* *C* *C* *C* *C*
	Serial set	Select port Baud rate Data bit Stop bit Parity Flow control Tx/Rx fifo Interface Tx/Rx bytes Line status				*C* *C* *C* *C* *C* *C* *C* *C* *D* *D*
	Op Mode set	Select port Select mode [mode]				*C* *C*
		Real COM Alive timeout Max connection Delimiter 1 Delimiter 2 Force Tx	TCP Server Alive timeout Inact. time Max connection Delimiter 1 Delimiter 2 Force Tx Local TCP port Command port	TCP Client Alive timeout Inact. time Delimiter 1 Delimiter 2 Force Tx Dest IP-1 TCP port-1 Dest IP-2 TCP port-2 Dest IP-3 TCP port-3 Dest IP-4 TCP port-4 TCP connect	UDP svr/cli Delimiter 1 Delimiter 2 Force Tx Dest IP start-1 Dest IP end-1 Dest port-1 Dest IP start-2 Dest IP end-2 Dest port-2 Dest IP start-3 Dest IP end-3 Dest port-3 Dest IP start-4 Dest IP end-4 Dest port-4 Local port	 *C* *C* *C* *C* *C* *C* *C* *C* *C* *C* *C* *C* *C* *C* *C* *C*
	Console	Web console Telnet console				*C* *C*
	Ping					*C*
	Save/Restart					*C*

The part of the LCM operation that still requires some explanation is how to edit the configurable options. In fact, you will only encounter two types of configurable options.

The first type involves entering numbers, such as IP addresses, Netmasks, etc. In this case, you change the number one digit at a time. The up cursor (△) is used to decrease the highlighted digit, the down cursor (▽) is used to increase the highlighted digit, and the sel button is used to move to the next digit. When the last digit has been changed, pressing sel simply enters the number into NPort Server Lite's memory.

The second type of configurable option is when there are only a small number of options from which to choose (although only one option will be visible at a time). Consider the PARITY attribute under PORT SETTING as an example. Follow the tree graph to arrive at the following PARITY screen. The first option, NONE, is displayed, with a down arrow all the way to the right. This is an indication that there are other options from which to choose.

P	a	r	i	t	Y										
N	O	n	e												↓

Press the down cursor button once to see EVEN as the second option.

P	a	r	i	t	Y										↑
E	v	e	n												↓

Press the down cursor button again to see ODD as the third option.

P	A	R	I	T	Y										↑
O	d	d													↓

Press the down cursor button again to see Mark as the fourth option.

P	A	R	I	T	Y										↑
M	a	r	k												↓

Press the down cursor button yet again to see the last option, Space.

P	A	R	I	T	Y										↑
S	p	a	c	e											

To choose the desired option, press the select button when the option is showing on the screen.

NPort Administration Suite

NPort Administration Suite consists of some useful utility programs that are used to configure and manage your NPorts.

See Chapter 5 for details on how to install NPort Administration Suite, and how to use this suite of useful utilities to set up IP addresses and configure your NPort.

ARP

You can make use of the ARP (Address Resolution Protocol) command to set up an IP address for your NPort. The ARP command tells your computer to associate the NPort's MAC address with the intended IP address. You must then use Telnet to access the NPort, at which point the Device Server's IP address will be reconfigured.

ATTENTION

In order to use this setup method, both your computer and NPort must be connected to the same LAN.

Or, you may use a cross-over Ethernet cable to connect the NPort directly to your computer's Ethernet card.

Your NPort must be configured with the factory default IP address—192.168.127.254—before executing the ARP command, as described below.

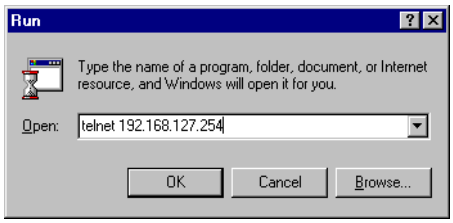
Take the following steps to use ARP to configure the IP address:

1. Obtain a valid IP address for your NPort from your network administrator.
2. Obtain the NPort's MAC address from the label on its bottom panel.
3. Execute the 'arp -s' command from your computer's MS-DOS prompt by typing:
   arp –s 192.168.200.100 00-90-E8-xx-xx-xx
   This is where 192.168.200.100 is the new IP address and 00-90-E8-xx-xx-xx is the MAC address for your NPort. You will need to change both numbers, as described above in points 1 and 2.
4. Next, execute a special Telnet command by typing:
   `telnet 192.168.200.100 6000`
   After issuing this command, a **Connect failed** message will appear, as shown here. After the NPort reboots, its IP address should be updated to the new address, and you can reconnect using either Telnet, Web, or Administrator to check that the update was successful.

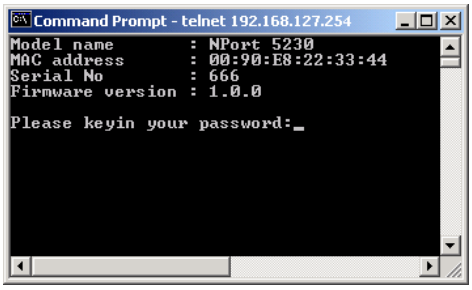
Telnet Console

Depending on how your computer and network are configured, you may find it convenient to use network access to set up your NPort's IP address. This can be done using the Telnet program.

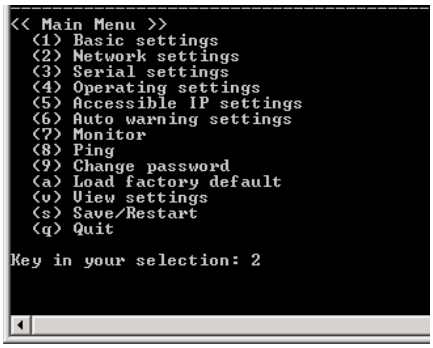
1. From the Windows desktop, click on **Start** and then select **Run**.
2. Type `telnet 192.168.127.254` (use the correct IP address if different from the default) in the **Open** text input box, and then click **OK**.



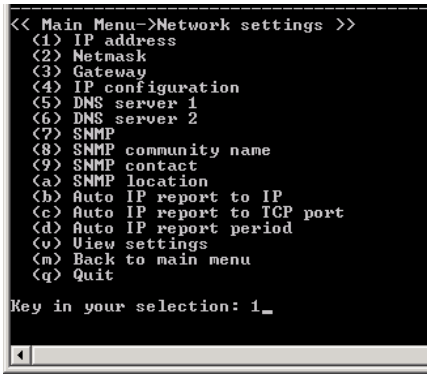
3. When the Telnet window opens, if you are prompted to input the **Console password**, input the password and then press **Enter**.
   Note that this page will only appear if the NPort is password protected.


Command Prompt - telnet 192.168.127.254
Model name : NPort 5230
MAC address : 00:90:E8:22:33:44
Serial No : 666
Firmware version : 1.0.0
Please keyin your password:

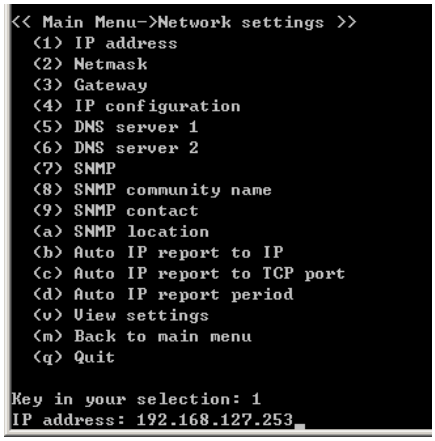
4. Type **2** to select **Network settings**, and then press **Enter**.



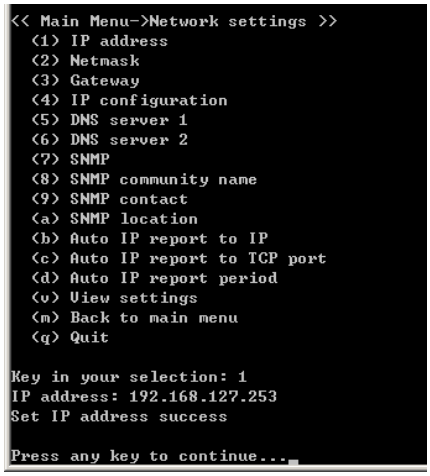
5. Type **1** to select **IP address** and then press **Enter**.



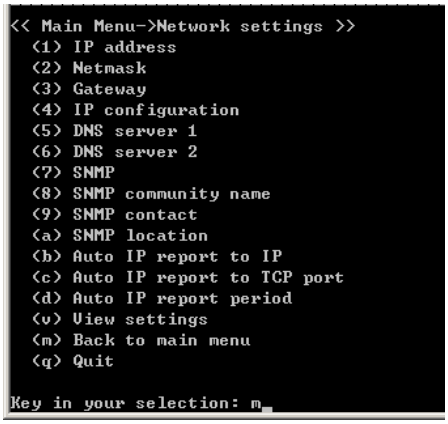
6. Use the **Backspace** key to erase the current IP address, type in the new IP address, and then press **Enter**.



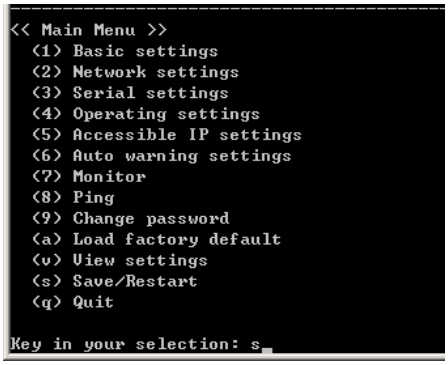
7. Press any key to continue…



8. Type **m** and then press **Enter** to return to the main menu.



9. Type **s** and then press **Enter** to **Save/Restart** the system.



10. Type **y** and then press **Enter** to save the new IP address and restart NPort.

4

Choosing the Proper Operation Mode

In this section, we describe the various NPort operation modes. The options include an operation mode that uses a driver installed on the host computer, and operation modes that rely on TCP/IP socket programming concepts. After choosing the proper operating mode in this chapter, refer to Chapter 5 for detailed configuration parameter definitions.

- **Overview**
- **TCP Server Mode**
- **TCP Client Mode**
- **UDP Mode**
- **Real COM Mode**

Overview

NPort Device Servers network-enable traditional RS-232/422/485 devices, in which a Device Server is a tiny computer equipped with a CPU, real-time OS, and TCP/IP protocols that can bi-directionally translate data between the serial and Ethernet formats. Your computer can access, manage, and configure remote facilities and equipment over the Internet from anywhere in the world.

Traditional SCADA and data collection systems rely on serial prots (RS-232/422/485) to collect data from various kinds of instruments. Since NPort Serial Device Servers network-enable instruments equipped with an RS-232/422/485 communication port, your SCADA and data collection system will be able to access all instruments connected to a standard TCP/IP network, regardless of whether the devices are used locally or at a remote site.

NPort is an external IP-based network device that allows you to expand the number of serial ports for a host computer on demand. As long as your host computer supports the TCP/IP protocol, you won't be limited by the host computer's bus limitation (such as ISA or PCI), or lack of drivers for various operating systems.

In addition to providing socket access, NPort also comes with a Real COM/TTY driver that transmits all serial signals intact. This means that your existing COM/TTY-based software can be preserved, without needing to invest in additional software.

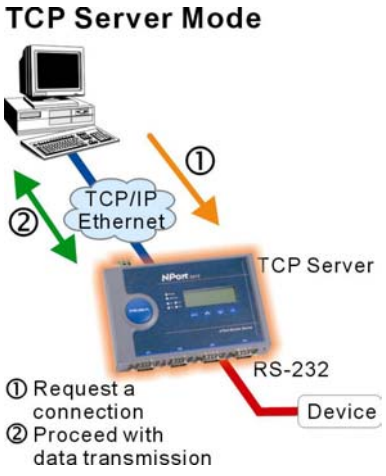
Three different Socket Modes are available: TCP Server, TCP Client, and UDP Server/Client. The main difference between the TCP and UDP protocols is that TCP guarantees delivery of data by requiring the recipient to send an acknowledgement to the sender. UDP does not require this type of verification, making it possible to offer speedier delivery. UDP also allows multicasting of data to groups of IP addresses.

ATTENTION

Pictures in this Chapter will use NPort 5400 series as an example.

TCP Server Mode

In TCP Server mode, NPort provides a unique IP:Port address on a TCP/IP network. NPort waits passively to be contacted by the host computer, allowing the host computer to establish a connection with and get data from the serial device. This operation mode also supports up to 4 simultaneous connections, so that multiple hosts can collect data from the same serial device—at the same time.



As illustrated in the figure, data transmission proceeds as follows:

1. The host requests a connection from the NPort configured for TCP Server Mode.
2. Once the connection is established, data can be transmitted in both directions—from the host to the NPort, and from the NPort to the host.

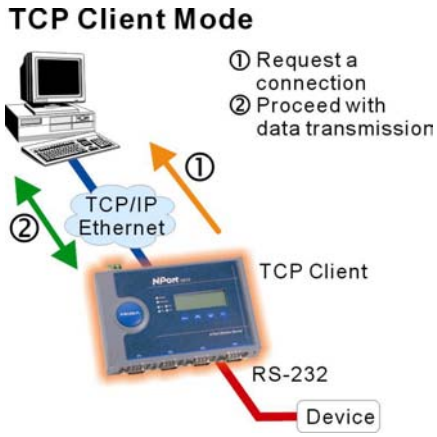
TCP Client Mode

In **TCP Client mode**, NPort can actively establish a TCP connection to a pre-defined host computer when serial data arrives.

After the data has been transferred, NPort can automatically disconnect from the host computer by using the **TCP alive check time** or **Inactivity time** settings. Refer to chapter 5 for more details.

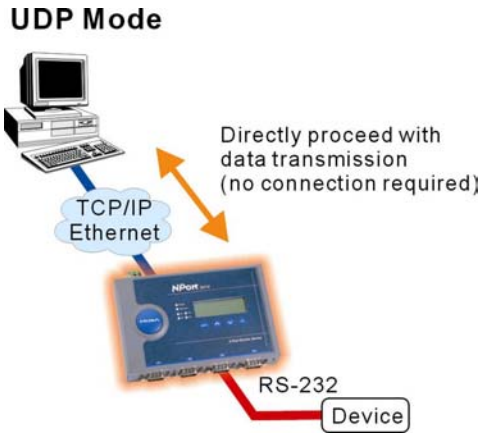
As illustrated in the figure, data transmission proceeds as follows:

1. The NPort configured for TCP Client Mode requests a connection from the host.
2. Once the connection is established, data can be transmitted in both directions—from the host to the NPort, and from the NPort to the host.



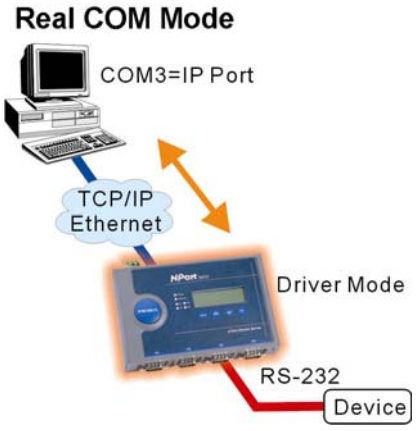
UDP Mode

Compared to TCP communication, UDP is faster and more efficient. In UDP mode, you can multicast data from the serial device to multiple host computers, and the serial device can also receive data from multiple host computers, making this mode ideal for message display applications.



Real COM Mode

NPort comes equipped with COM drivers that work with Windows 95/98/ME/NT/2000/XP systems, and also TTY drivers for Linux systems. The driver establishes a transparent connection between host and serial device by mapping the IP:Port of the NPort's serial port to a local COM/TTY port on the host computer.



ATTENTION

The driver used for Real COM Mode comes with the NPort Windows Administrator which will install automatically on your computer when you install NPort Administration Suite.

The important point is that Real COM Mode allows users to continue using RS-232/422/485 serial communications software that was written for pure serial communications applications. The driver intercepts data sent to the host's COM port, packs it into a TCP/IP packet, and then redirects it through the host's Ethernet card. At the other end of the connection, the NPort accepts the Ethernet frame, unpacks the TCP/IP packet, and then transparently sends it to the appropriate serial device attached to one of the NPort's serial ports.

ATTENTION

Real COM Mode allows several hosts to have access control of the same NPort. The Moxa driver that comes with your NPort controls host access to attached serial devices by checking the host's IP address.

Modify the Accessible IP Setting table when the legal IP address should be required in your application.

5

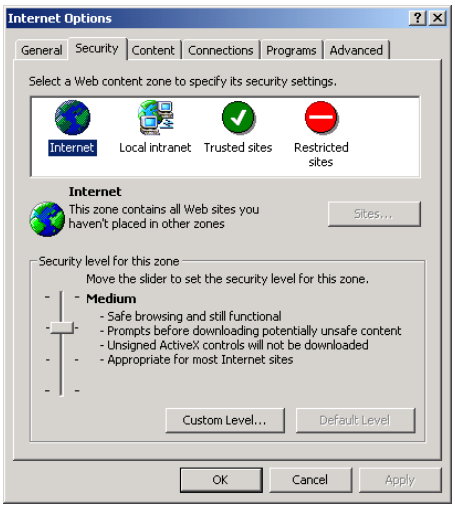
Web Console Configuration

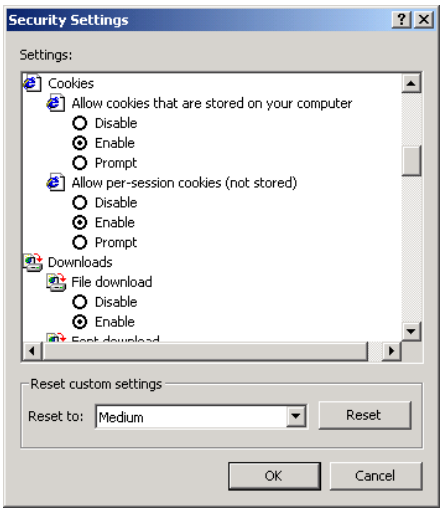
The Web Console is the most user-friendly way to configure NPort 5410/5430/5340I. This chapter will introduce the Web Console function groups and function definitions. This chapter use NPort 52300 as an example. The function and definition is totally the same with NPort 5400 series.

- **Opening Your Browser**
- **Basic Settings**
- **Network Settings**
- **Serial Settings**
- **Operation Mode Settings**
- **Accessible IP Settings**
- **Auto Warning Settings**
- **Change Password**
- **Load Factory Default**
- **Save/Restart**

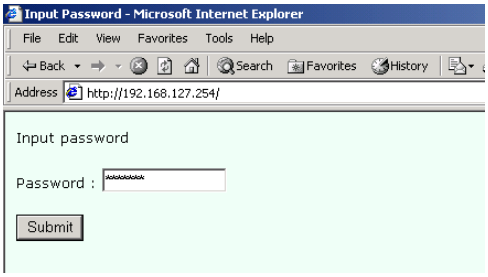
Opening Your Browser

1. Open your browser with the cookie function enabled. (To enable your browser for cookies, right click on your desktop Internet Explorer icon, select Properties, click on the Security tab, and then select the three Enable options as shown in the figure below.)





2. Type `192.168.127.254` in the **Address** input box (use the correct IP address if different from the default), and then press **Enter**.
3. Input the password if prompted. The password will be transmitted with MD5 encryption over the Ethernet.
   Note that you will not be prompted to enter the password if the NPort is not currently password protected.



ATTENTION

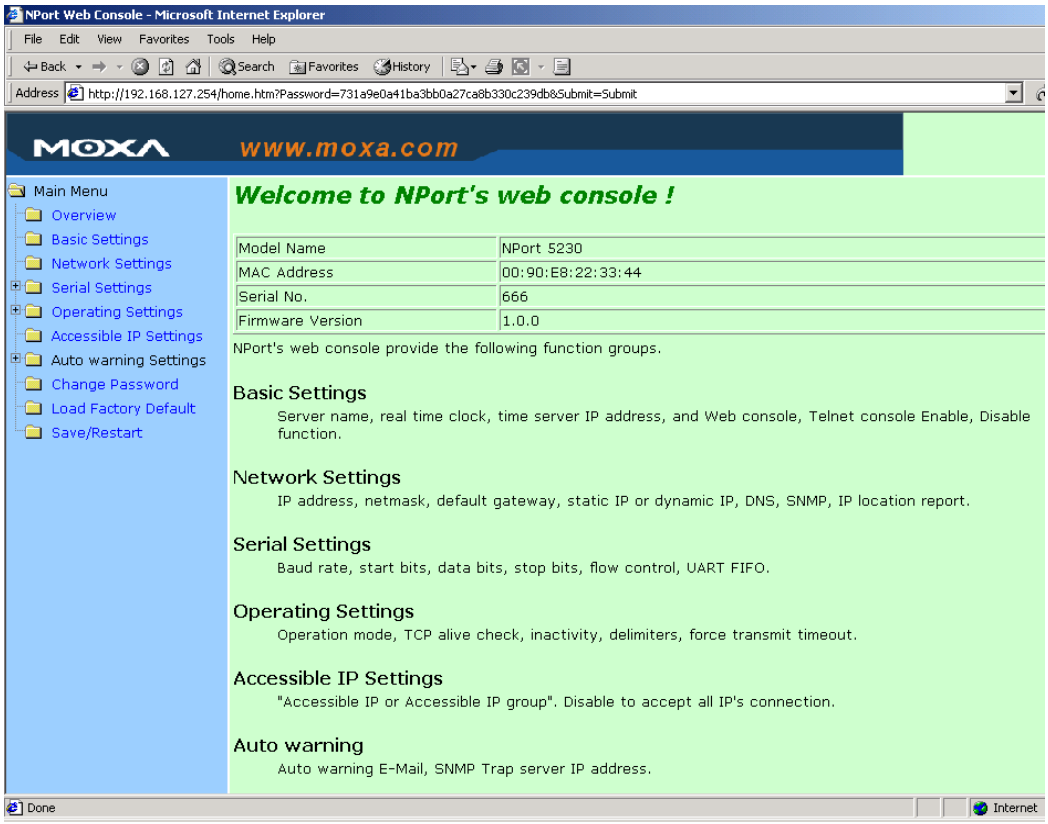
If you use other web browsers, remember to Enable the functions to "allow cookies that are stored on your computer" or "allow per-session cookies".

Cookies that used by NPort, is only for the "password" transmission.

ATTENTION

Refer to Chapter 3 "Initial IP Address Configuration" for the IP configuration. Examples that used in this chapter are using Factory Default IP address (192.168.127.254).

4. The NPort 5410/5430/5340I homepage will open. On this page, you can see a brief description of the Web Console's nine function groups.


NPort Web Console - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites History
Address http://192.168.127.254/home.htm?Password=731a9e0a41ba3bb0a27ca8b330c239db&Submit=Submit
MOXA www.moxa.com
Main Menu
Overview
Basic Settings
Network Settings
Serial Settings
Operating Settings
Accessible IP Settings
Auto warning Settings
Change Password
Load Factory Default
Save/Restart
Welcome to NPort's web console !
Model Name NPort 5230
MAC Address 00:90:E8:22:33:44
Serial No. 666
Firmware Version 1.0.0
NPort's web console provide the following function groups.
Basic Settings
Server name, real time clock, time server IP address, and Web console, Telnet console Enable, Disable function.
Network Settings
IP address, netmask, default gateway, static IP or dynamic IP, DNS, SNMP, IP location report.
Serial Settings
Baud rate, start bits, data bits, stop bits, flow control, UART FIFO.
Operating Settings
Operation mode, TCP alive check, inactivity, delimiters, force transmit timeout.
Accessible IP Settings
"Accessible IP or Accessible IP group". Disable to accept all IP's connection.
Auto warning
Auto warning E-Mail, SNMP Trap server IP address.
Done
Internet

ATTENTION

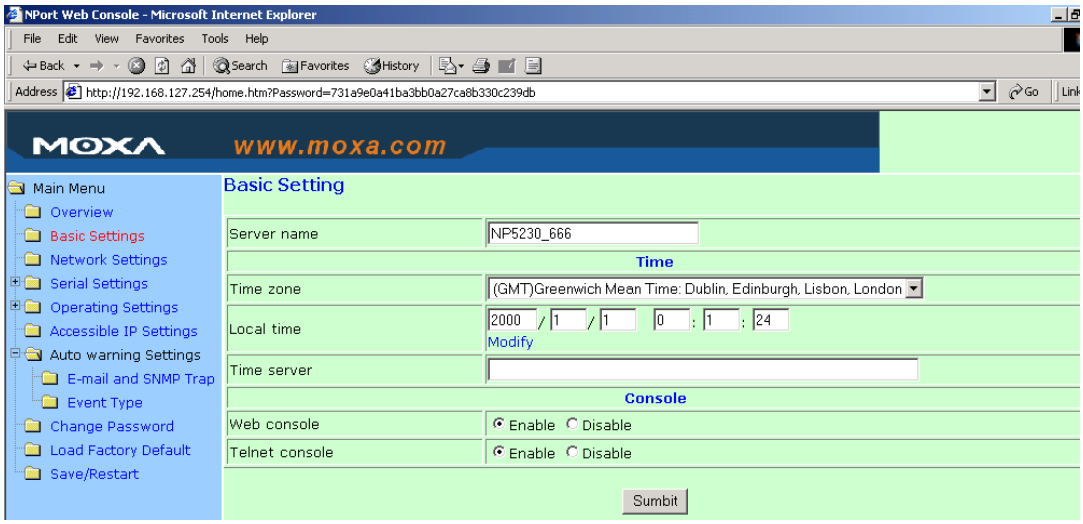
If you can't remember the password, the ONLY way to start configuring NPort is to load factory defaults by using the Reset button located near the NPort's RJ45 Ethernet port.

Remember to use Windows Administrator to export the configuration file when you have finished the configuration. After using the Reset button to load factory defaults, your configuration can be easily reloaded into NPort by using the Windows Administrator Import function. Refer to Chapter 6 for more details about using the Export and Import functions.

ATTENTION

If your NPort application requires using password protection, you must enable the cookie function in your browser. If the cookie function is disabled, you will not be allowed to enter the Web Console Screen.

Basic Settings



Server name

Setting	Factory Default	Necessity
1 to 29 characters	NP[model name]_[Serial No.]	Optional

This option is useful for specifying the location or application of different NPorts.

Time

NPort 5410/5430/5340I has a built-in Real-Time Clock for time calibration functions. Functions such as Auto warning "Email" or "SNMP Trap" can add real-time information to the message.

ATTENTION

First time users should select the time zone first. The Console will display the "real time" according to the time zone compared to GMT.
If you would like to modify the real time clock, select "Local Time." NPort's firmware will modify the GMT time according to the Time Zone.

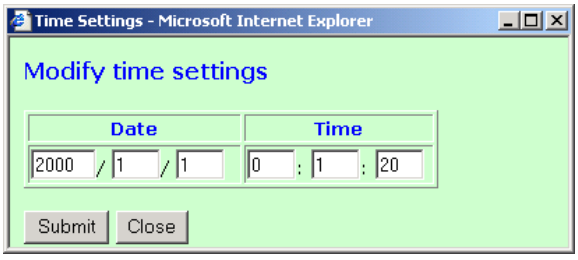
Time zone

Setting	Factory Default	Necessity
User selectable time zone	GMT (Greenwich Mean Time)	Optional

Local time

Setting	Factory Default	Necessity
User adjustable time.	GMT (Greenwich Mean Time)	Optional

Click on the **Modify** button to open the **Modify time settings** window to input the correct local time.



Time server

Setting	Factory Default	Necessity
IP or Domain address (E.g., 192.168.1.1 or time.stdtime.gov.tw or time.nist.gov)	None	Optional

NPort 5410/5430/5340I uses SNTP (RFC-1769) for auto time calibration.

Input the correct "Time Server" IP address or domain address. Once NPort is configured with the correct Time Server address, NPort will request time information from the "Time Server" every 10 minutes.

Console

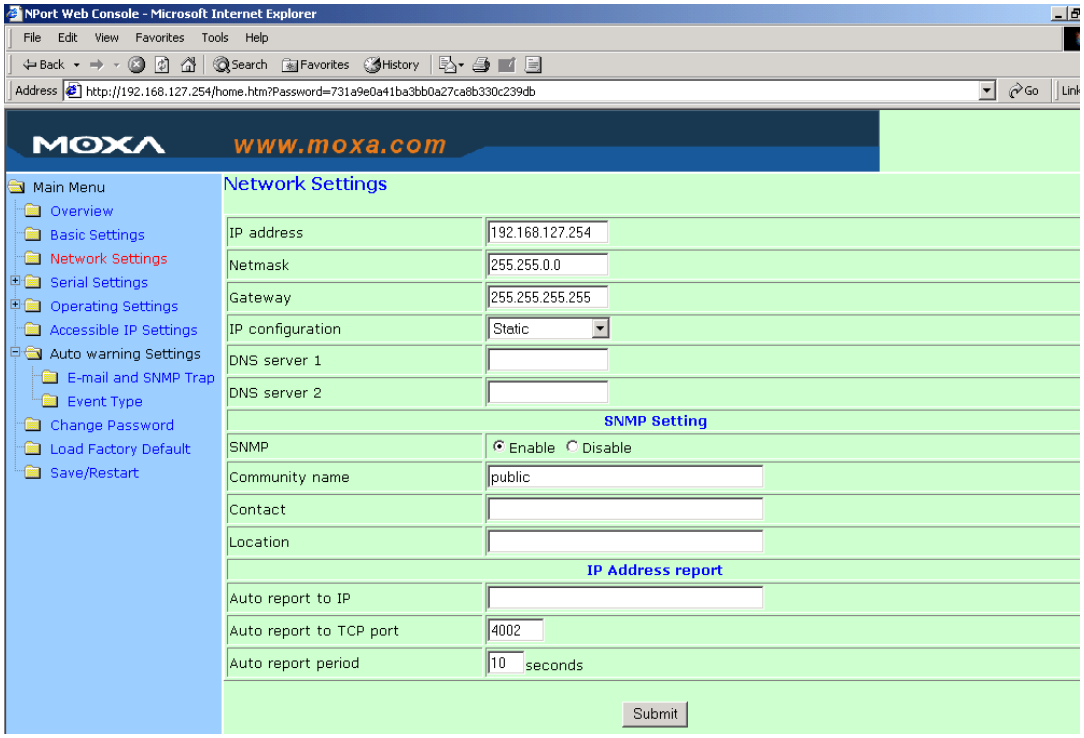
The "Disable" option for Web Console and Telnet Console is included for security reasons. In some cases, you may want to Disable one or both of these Console utilities as an extra precaution to prevent unauthorized users from accessing your NPort. The factory default for both Web Console and Telnet Console is **Enable**.

Setting	Factory Default	Necessity
Enable or Disable	Enable	Required

ATTENTION

If you disable both the "Web Console" and "Telnet Console," you can still use the LCM Display to configure NPort locally, or Windows Administrator to configure NPort either locally or remotely over the network.

Network Settings



You must assign a valid IP address to NPort 5410/5430/5340I before it will work in your network environment. Your network system administrator should provide you with an IP address and related settings for your network. The IP address must be unique within the network (otherwise, NPort 5410/5430/5340I will not have a valid connection to the network). First time users can refer to Chapter 3, *Initial IP Address Configuration*, for more information.

You can choose from four possible IP Configuration modes—**Static**, **DHCP**, **DHCP/BOOTP**, and **BOOTP**—located under the web console screen's IP configuration drop-down box.

Method	Function Definition
Static	**User defined** IP address, Netmask, Gateway.
DHCP	DHCP Server assigned IP address, Netmask, Gateway, DNS, and Time Server
DHCP/BOOTP	DHCP Server assigned IP address, Netmask, Gateway, DNS, and Time Server, or BOOTP Server assigned IP address
BOOTP	BOOTP Server assigned IP address

IP Address

Setting	Factory Default	Necessity
E.g., 192.168.1.1 (IP addresses of the form *x.x.x*.0 and *x.x.x*.255 are invalid.)	192.168.127.254	Required

An IP address is a number assigned to a network device (such as a computer) as a permanent address on the network. Computers use the IP addressed to identify and talk to each other over the network. Choose a proper IP address which is unique and valid in your network environment.

Netmask

Setting	Factory Default	Necessity
Ex. 255.255.255.0	255.255.0.0	Required

A subnet mask represents all the network hosts at one geographic location, in one building, or on the same local area network. When a packet is sent out over the network, the NPort will use the subnet mask to check whether the desired TCP/IP host specified in the packet is on local network segment. If the address is on the same network segment as the NPort, a connection established directly from the NPort. Otherwise, the connection is established through the given default gateway.

Gateway

Setting	Factory Default	Necessity
Ex. 192.168.1.1	None	Optional

A gateway is a network gateway that acts as an entrance to another network. Usually, the computers that control traffic within the network or at the local Internet service provider are gateway nodes. NPort needs to know the IP address of the default gateway computer in order to communicate with the hosts outside the local network environment. For correct gateway IP address information, consult the network administrator.

IP Configuration

Setting	Factory Default	Necessity
Static DHCP DHCP/BOOTP BOOTP	Static	Required

ATTENTION

In Dynamic IP environments, the firmware will retry 3 times every 30 seconds until network settings are assigned by the DHCP or BOOTP server. The Timeout for each try increases from 1 second, to 3 seconds, to 5 seconds.

If the DHCP/BOOTP Server is unavailable, the firmware will use the default IP address, 192.168.127.254, Netmask, and Gateway for IP settings.

DNS server 1 / DNS sever 2

Setting	Factory Default	Necessity
E.g., 192.168.1.1 (IP addresses of the form *x.x.x*.0 and *x.x.x*.255 are invalid.)	None	Optional

When the user wants to visit a particular website, the computer asks a Domain Name System (DNS) server for the website's correct IP address, and the computer users the response to connect to the web server. DNS is the way that Internet domain names are identified and translated into IP addresses. A domain name is an alphanumeric name, such as moxa.com, that it is usually easier to remember. A DNS server is a host that translates this kind of text-based domain name into the numeric IP address used to establish a TCP/IP connection.

In order to use NPort's DNS feature, you need to set the IP address of the DNS server to be able to access the host with the domain name. NPort provides **DNS server 1** and **DNS server 2** configuration items to configure the IP address of the DNS server. DNS Server 2 is included for use when DNS sever 1 is unavailable.

NPort plays the role of DNS client. Functions that support domain name in NPort are **Time Sever IP Address**, **TCP Client-Destination IP Address**, **Mail Server**, **SNMP Trap IP Address**, and **IP Location Server**.

SNMP Settings

Community Name

Setting	Factory Default	Necessity
1 to 39 characters (E.g., Support, 886-89191230 #300)	public	Optional

A community name is a plain-text password mechanism that is used to weakly authenticate queries to agents of managed network devices.

Contact

Setting	Factory Default	Necessity
1 to 39 characters (E.g., Support, 886-89191230 #300)	None	Optional

The SNMP contact information usually includes an emergency contact name and telephone or pager number.

Location

Setting	Factory Default	Necessity
1 to 39 characters (E.g., Floor 1, office 2)	None	Optional

Specify the location string for SNMP agents such as NPort. This string is usually set to the street address where the NPort is physically located.

IP Address Report

When NPort 5000 series products are used in a dynamic IP environment, users must spend more time with IP management tasks. For example, NPort works as a server (TCP or UDP), and the host, which acts as a client, must know the IP address of the server. If the DHCP server assigns a new IP address to the server, the host must take care of what happens when the IP changes.
NPort 5000 series products help out by periodically reporting their IP address to the IP location server, in case the dynamic IP has changed. The parameters shown below are used to configure the Auto IP report function. There are two ways to develop an "Auto IP report Server" to receive NPort's Auto IP report.

1. Use NPort Administrator's IP Address Report function.
2. Refer the Appendix C for the "Auto IP report protocol" to develop your own software.

Auto report to IP

Setting	Factory Default	Necessity
E.g., 192.168.1.1 or URL (IP addresses of the form *x.x.x*.0 and *x.x.x*.255 are invalid.)	None	Optional

Reports generated by the Auto report function will be automatically sent to this IP address.

Auto report to TCP port

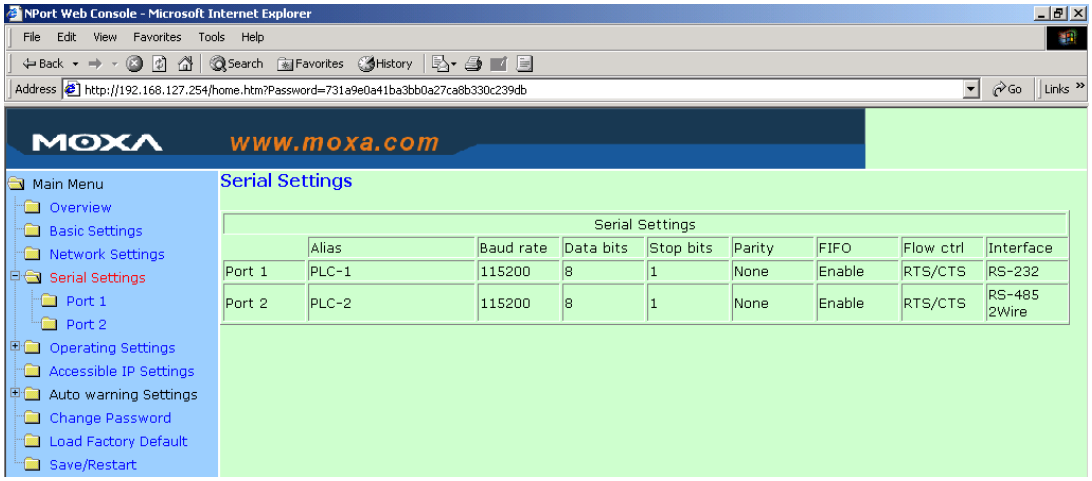
Setting	Factory Default	Necessity
E.g., 4001	4002	Optional

Auto report period

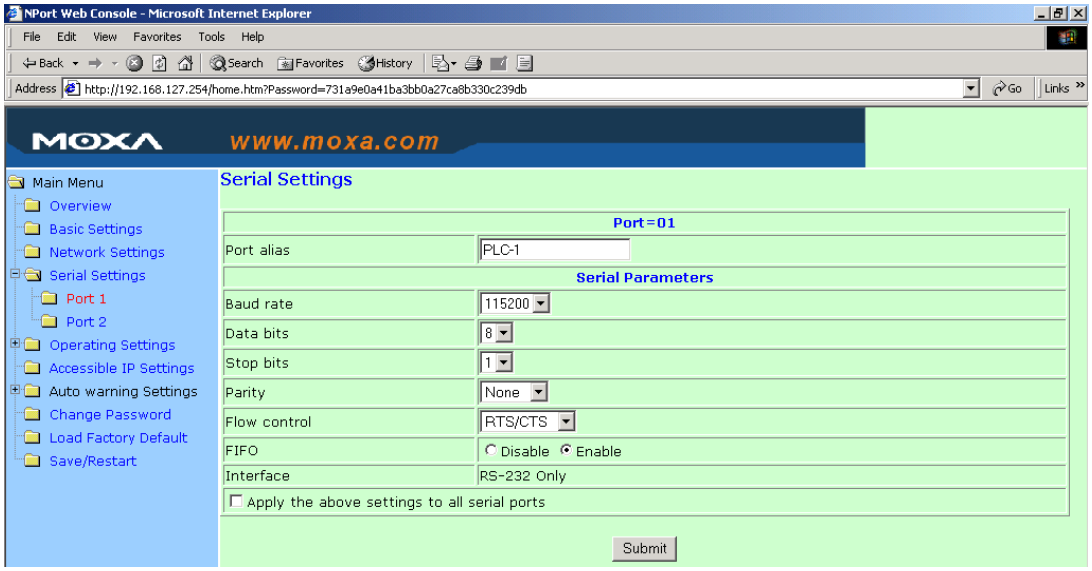
Setting	Factory Default	Necessity
Time interval (in seconds)	10	Optional

Serial Settings

Click on **Serial Settings**, located under Main Menu, to display serial port settings for ports 1 and 2.



To modify serial settings for a particular port, click on either **Port 1** or **Port 2** under Serial Settings.



Port alias

Setting	Factory Default	Necessity
1 to 20 characters (E.g., PLC-No.1)	None	Optional

Port Alias is specially designed to allow easy identification of the serial devices which are connected to NPort's serial port.

Serial Parameters

ATTENTION

Check the serial communication parameters in your Serial Device's user's manual. You should set up NPort's serial parameters with the same communication parameters used by your serial devices.

Baud rate

Setting	Factory Default	Necessity
50 bps to 230400 bps	115200 bps	Required

NPort supports baud rate setting from 50 bps to 230.4 Kbps.

Data bits

Setting	Factory Default	Necessity
5, 6, 7, 8	8	Required

When the user sets Data bits to 5 bits, the stop bits setting will automatically change to 1.5 bits.

Stop bits

Setting	Factory Default	Necessity
1, 2	1	Required

Stop bits will be set to 1.5 when Data bits is set to 5 bits.

Parity

Setting	Factory Default	Necessity
None, Even, Odd, Space, Mark	None	Required

Flow control

Setting	Factory Default	Necessity
None, RTS/CTS, DTR/DSR, Xon/Xoff	RTS/CTS	Required

FIFO

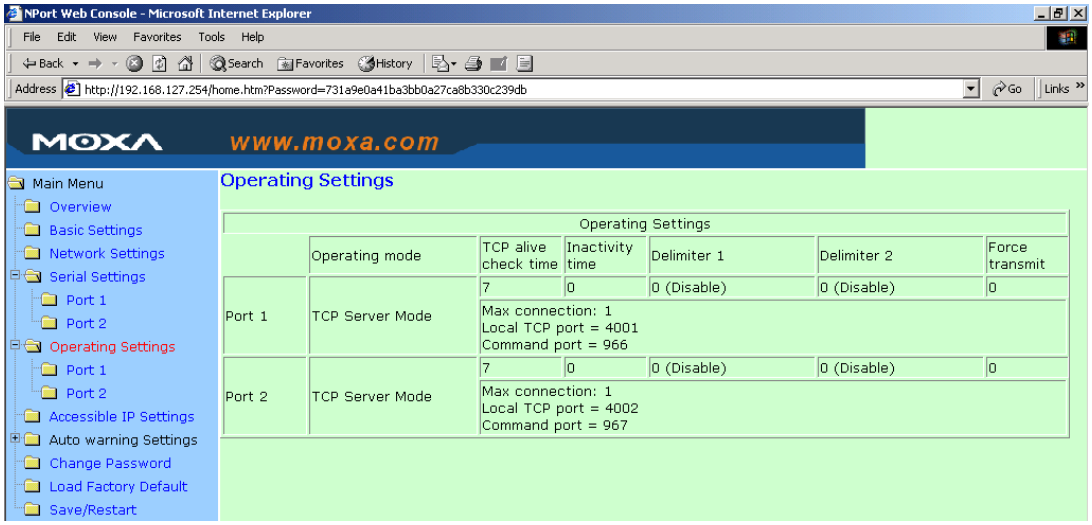
Setting	Factory Default	Necessity
Enable, Disable	Enable	Required

NPort's serial ports provide a 16-byte FIFO both in the Tx and Rx directions. Disable the FIFO setting when your serial device does not have a FIFO to prevent data loss during communication.

Interface

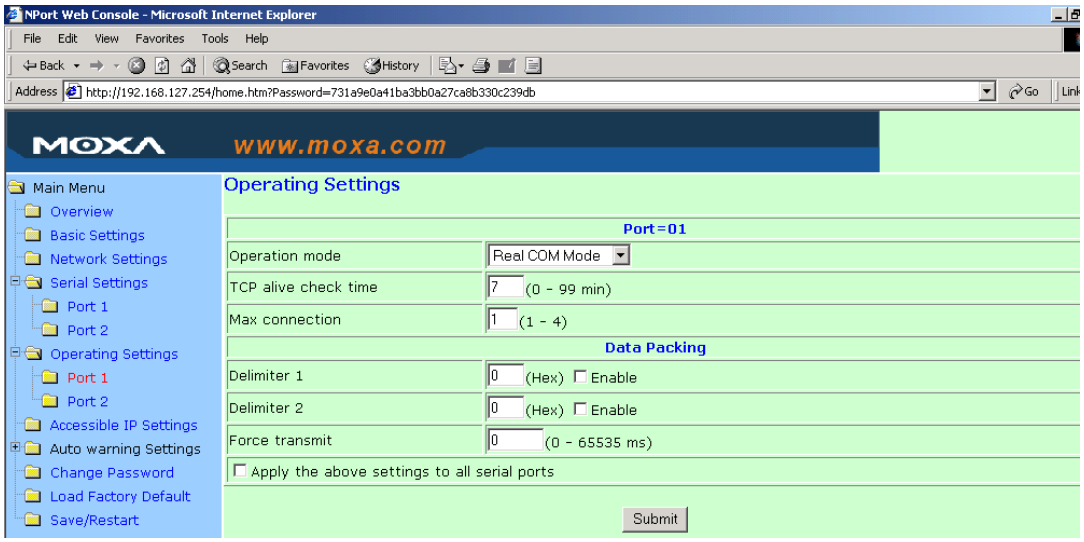
Setting	Factory Default	Necessity
NPort 5210: RS-232 only	NPort 5210: RS-232	Required
NPort 5230: RS-232 for port 1 RS-422, 2-wire RS-485, 4-wire RS-485 for port 2	NPort 5230: Port 1: RS-232 Port 2: RS-485 2-wire	Required

Operating Settings



Press **Operating Settings** to display the operating settings for all of NPort's serial ports.

Real COM Mode



TCP alive check time

Setting	Factory Default	Necessity
0 to 99 min	7 min	Optional

0 min: TCP connection is not closed due to an idle TCP connection.

1 to 99 min: NPort automatically closes TCP connection if there is no TCP activity for the given time. After the connection is closed, NPort starts listening for another Real COM driver's connection from another host.

Max Connection

Setting	Factory Default	Necessity
1, 2, 3, 4	1	Required

Max Connection is usually used when the user needs to receive data from different hosts simultaneously. The factory default only allows 1 connection at a same. When Max Connection is set to 1, the Real COM driver on the specific host has the full control.

Max. Connection 1:

Allows only 1 host's Real COM driver to open the specific NPort serial port.

Max Connection 2 to 4:

Allows 2 to 4 host's Real COM drivers to open the specific NPort serial port, at the same time. When multiple hosts' Real COM drivers open the serial port at the same time, the COM driver only provides a pure data tunnel without control ability.

Application software that is based on the COM driver will receive a driver response of "success" when the software uses any of the Win32 API functions. The firmware will only send the data back to the driver on the host.

Data will be sent first-in-first-out when data comes into the NPort from the Ethernet interface.

ATTENTION

When Max Connection is not 1, it also means that NPort will be in "multi connection application". In the "multi connection application", when one of two to four host close the COM port, NPort will suspend to receive or send serial data until the host successfully close the COM port.

In multi connection application, NPort will use the serial communication parameters set in console. If the host open COM with different parameters to NPort's console setting, data communication may not work properly

Delimiter 1

Setting	Factory Default	Necessity
00 to FF	None	Optional

Once the NPort receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort's Ethernet port.

Delimiter 2

Setting	Factory Default	Necessity
00 to FF	None	Optional

Once the NPort receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort's Ethernet port.

ATTENTION

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1K, the NPort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

Force Transmit

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: Disable the force transmit timeout.

1 to 65535: Forces the NPort's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame.

This parameter defines the time interval during which NPort fetches the serial data from it's internal buffer. If data is incoming through the serial port, NPort stores the data in the internal buffer. NPort transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified under Force Transmit timeout.

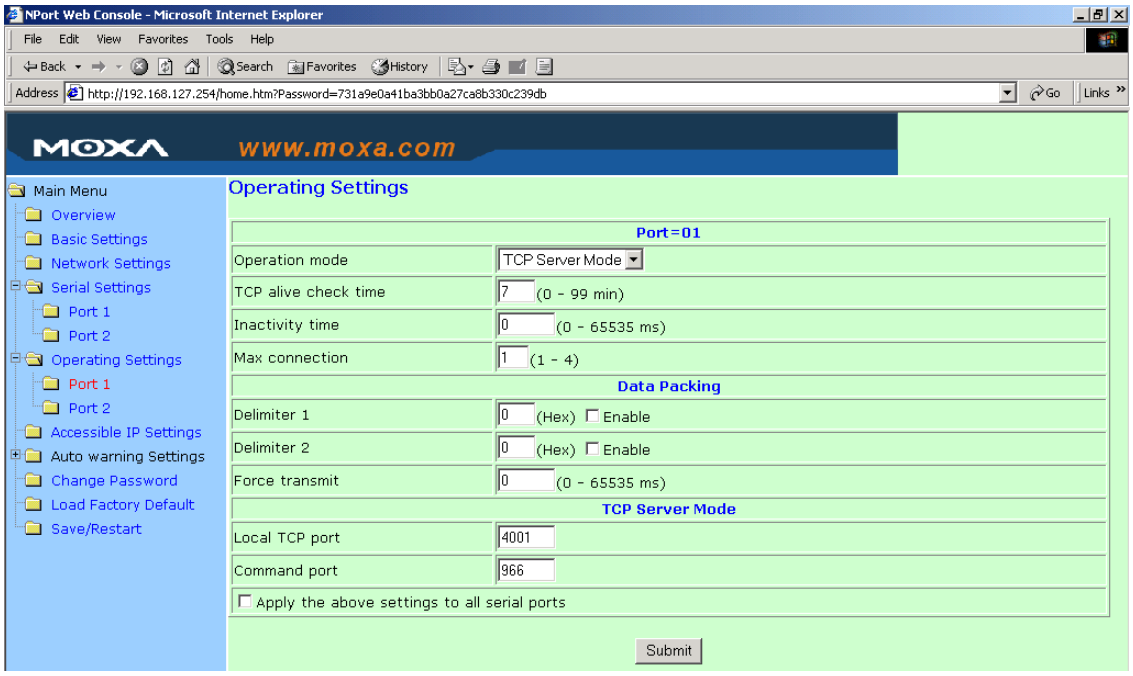
Optimal force transmit timeout differs according to your application, but it must be at least larger than one character interval within the specified baud rate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is

10 (bits) / 1200 (bits/s) * 1000 (ms/s) = 8.3 ms.

Therefore, you should set Force Transmit timeout to be larger than 8.3 ms. Force Transmit timeout is specified in milliseconds and must be larger than 10 ms.

If the user wants to send the series of characters in a packet, the serial device attached to NPort should send characters without time delay larger than Force Transmit timeout between characters and the total length of data must be smaller than or equal to NPort's internal buffer size. The serial communication buffer size of NPort is 1 Kbytes per port.

TCP Server Mode



TCP alive check time

Setting	Factory Default	Necessity
0 to 99 min	7 min	Optional

0 min: TCP connection is not closed due to an idle TCP connection.

1 to 99 min: NPort automatically closes the TCP connection if there is no TCP activity for the given time. After the connection is closed, NPort starts listening for another host's TCP connection.

Inactivity time

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0 ms: TCP connection is not closed due to an idle serial line.

0-65535 ms: NPort automatically closes the TCP connection if there is no serial data activity for the given time. After the connection is closed, NPort starts listening for another host's TCP connection.

This parameter defines the maintenances status as Closed or Listen on the TCP connection. The connection is closed if there is no incoming or outgoing data through the serial port during the specific Inactivity time.

If the value of inactivity time is set to 0, the current TCP connection is maintained until there is connection close request. Although inactivity time is disabled, the NPort will check the connection status between the NPort and remote host by sending "keep alive" packets periodically. If the remote host does not respond to the packet, it assumes that the connection was closed down unintentionally. NPort will then force the existing TCP connection to close.

ATTENTION

At least, the Inactivity time should be set larger than that of Force Transmit timeout. To prevent the unintended loss of data due to the session disconnected, it is highly recommended that this value is set large enough so that the intended data transfer is completed.

Max Connection

Setting	Factory Default	Necessity
1, 2, 3, 4	1	Required

Max Connection is usually used when the user needs to receive data from different hosts simultaneously. The factory default only allows 1 connection at a time.

Max. Connection 1:

NPort only allows 1 host to open the TCP connection to the specific serial port.

Max Connection 2 to 4:

Allows 2 to 4 host's TCP connection request to open the specific NPort serial port, at the same time. When multiple hosts establish a TCP connection to the specific serial port at the same time, NPort will duplicate the serial data and transmit to all of the hosts. Ethernet data is sent on a first-in-first-out basis to the serial port when data comes into NPort from the Ethernet interface.

Delimiter 1

Setting	Factory Default	Necessity
00 to FF	None	Optional

Once the NPort receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort's Ethernet port.

Delimiter 2

Setting	Factory Default	Necessity
00 to FF	None	Optional

Once the NPort receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort's Ethernet port.

ATTENTION

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1K, the NPort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

Force Transmit

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: Disable the force transmit timeout.

1 to 65535: Forces the NPort's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame.

This parameter defines the time interval during which NPort fetches the serial data from its internal buffer. If there is incoming data through the serial port, NPort stores data in the internal buffer. NPort transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified as Force Transmit timeout.

Optimal force transmit timeout differs according to your application, but it must be at least as large as one character interval within the specified baud rate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits required to send a character is 10 bits and the time required to transfer one character is

10 (bits) / 1200 (bits/s) * 1000 (ms/s) = 8.3 ms.

Therefore, you should set Force Transmit timeout to be larger than 8.3 ms. Force Transmit timeout is specified in milliseconds and must be larger than 10 ms.

If the user wants to send a series of character in a packet, the serial device attached to NPort should send characters without time delay larger than Force Transmit timeout between characters and the total length of data must be smaller than or equal to NPort's internal buffer size. NPort's serial communication buffer size is 1K bytes per port.

Local TCP port

Setting	Factory Default	Necessity
1 to 65535	4001	Required

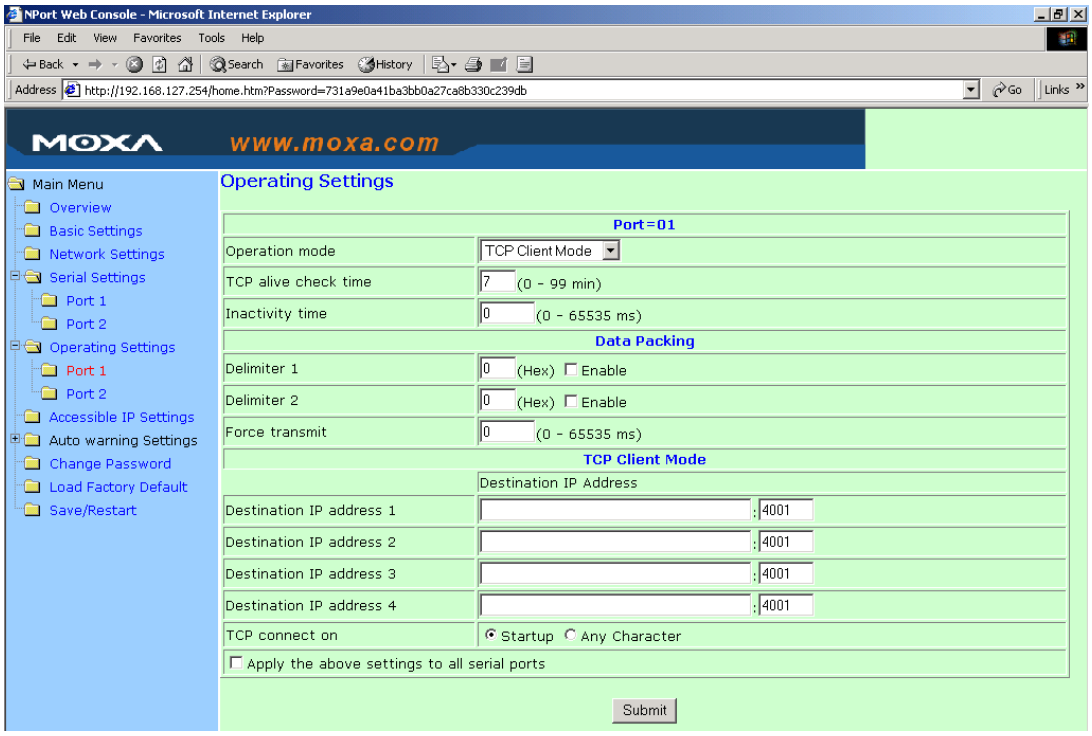
The TCP port that NPort uses to listen to connections, and that other devices must use to contact NPort. To avoid conflicts with well known TCP ports, the default is set to 4001.

Command port

Setting	Factory Default	Necessity
1 to 65535	966	Optional

The command port is a listen TCP port for IP-Serial Lib commands from the host. In order to prevent a TCP port conflict with other applications, the user can adjust the command port to another port if needed. And IP-Serial Lib will automatically check out the Command Port on NPort so that the user does not need to configure the program.

TCP Client Mode



TCP alive check time

Setting	Factory Default	Necessity
0 to 99 min	7 min	Optional

0 min: TCP connection is not closed due to an idle TCP connection.

1 to 99 min: NPort automatically closes the TCP connection if there is no TCP activity for the given time.

Inactivity time

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0 ms: TCP connection is not closed due to an idle serial line.

0-65535 ms: NPort automatically closes TCP connection, if there is no serial data activity for the given time.

This parameter defines the maintenances status as Closed or Listen on the TCP connection. The connection is closed if there is no incoming or outgoing data through the serial port during the specific Inactivity time.

If the value of inactivity time is set to 0, the current TCP connection is maintained until there's connection close request. Although the inactivity time is disabled, the NPort will check the connection status between the NPort and remote host by sending "keep alive" packets periodically. If the remote host does not respond to the packets, it treats the connection as being down unintentionally. NPort will then force the existing TCP connection to close.

ATTENTION

At least, the Inactivity time should be set larger than that of Force Transmit timeout. To prevent the unintended loss of data due to the session disconnected, it is highly recommended that this value is set large enough so that the intended data transfer is completed.

ATTENTION

Inactivity time is ONLY active when "TCP connection on" is set to "Any character."

Delimiter 1

Setting	Factory Default	Necessity
00 to FF	None	Optional

Once the NPort receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort's Ethernet port.

Delimiter 2

Setting	Factory Default	Necessity
00 to FF	None	Optional

Once the NPort receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort's Ethernet port.

ATTENTION

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1K, the NPort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

Force Transmit

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: Disable the force transmit timeout.

1 to 65535: Forces the NPort's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame.

This parameter defines the interval during which NPort fetches the serial data from its internal buffer. If there is incoming data through the serial port, NPort stores data in the internal buffer. NPort transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified as Force Transmit timeout.

Optimal force transmit timeout differs according to your application, but it must be at least as large as one character interval within the specified baud rate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits required to send a character is 10 bits, and the time required to transfer one character is

10 (bits) / 1200 (bits/s) * 1000 (ms/s) = 8.3 ms.

Therefore, you should set Force Transmit timeout to be larger than 8.3 ms. Force Transmit timeout is specified in milliseconds and must be larger than 10 ms.

If the user wants to send a series of characters in a packet, the serial device attached to NPort should send characters without time delay larger than Force Transmit timeout between characters and the total length of data must be smaller than or equal to NPort's internal buffer size. The serial communication buffer size of NPort is 1 Kbytes per port.

Destination IP address 1

Setting	Factory Default	Necessity
IP address or Domain Address (E.g., 192.168.1.1)	None	Required

Allows NPort to connect actively to the remote host whose address is set by this parameter.

Destination IP address 2/3/4

Setting	Factory Default	Necessity
IP address or Domain Address (E.g., 192.168.1.1)	None	Optional

Allows NPort to connect actively to the remote host whose address is set by this parameter.

ATTENTION

Up to 4 connections can be established between NPort and hosts. The connection speed or throughput maybe low due to efficiency in one of the four connections is slow. Other 3 connection was delayed by waiting the slowest connection finished.

ATTENTION

The "Destination IP address" parameter not only can use IP address, but also can input the Domain address. For some applications, the user may need to send the data actively to the remote destination domain address.

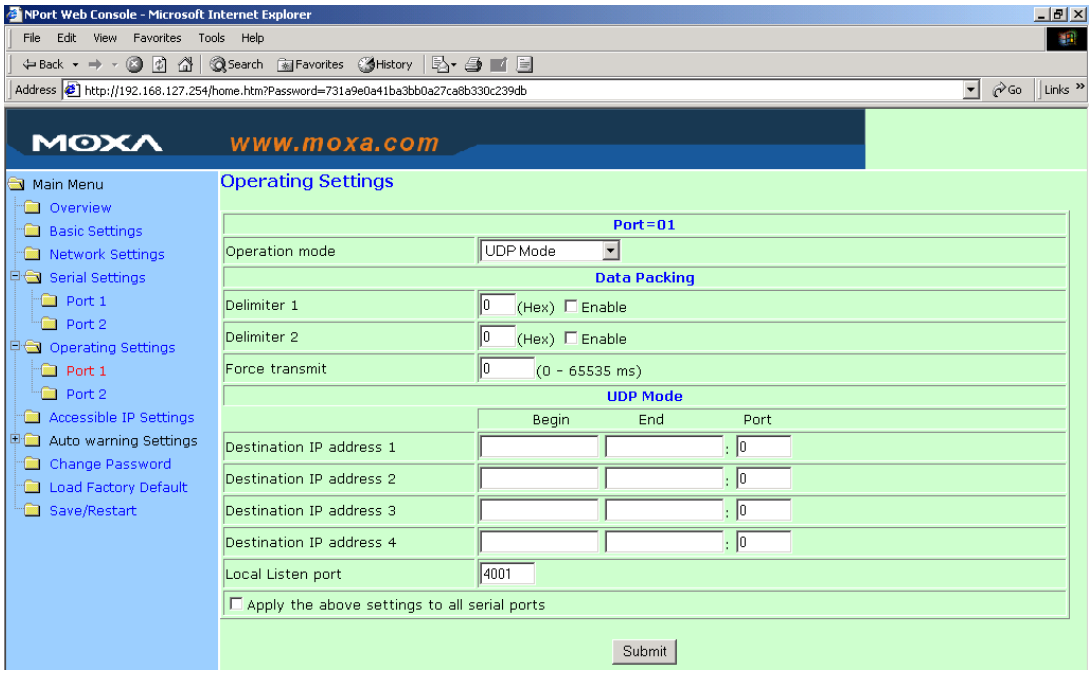
TCP connection

Setting	**Factory Default**	**Necessity**
Start up, Any character	None	Optional

Start up: Attempts to establish a TCP connection as soon as the NPort is powered on.

Any Character: Attempts to establish a TCP connection as soon as the NPort starts receiving serial data.

UDP Mode



Delimiter 1

Setting	Factory Default	Necessity
00 to FF	None	Optional

Once the NPort receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort's Ethernet port.

Delimiter 2

Setting	Factory Default	Necessity
00 to FF	None	Optional

Once the NPort receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort's Ethernet port.

Note: Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer.

ATTENTION

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1K, the NPort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

Force Transmit

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: Disable the force transmit timeout.

1 to 65535: Forces the NPort's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame.

This parameter defines the interval during which NPort fetches the serial data from its internal buffer. If there is incoming data through the serial port, NPort stores the data in the internal buffer. NPort transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified as Force Transmit timeout.

Optimal force transmit timeout differs according to your application, but it must be at least as large as one character interval within the specified baud rate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits required to send a character is 10 bits and the time required to transfer one character is

10 (bits) / 1200 (bits/s) * 1000 (ms/s) = 8.3 ms.

Therefore, you should set the Force Transmit timeout to be larger than 8.3 ms. Force Transmit timeout is specified in milliseconds and must be larger than 10 ms.

If the user wants to send a series of characters in a packet, the serial device attached to NPort should send characters without time delay larger than Force Transmit timeout between characters and the total length of data must be smaller than or equal to NPort's internal buffer size. The serial communication buffer size of NPort is 1 Kbyte per port.

Destination IP address 1

Setting	Factory Default	Necessity
IP address range E.g., Begin: 192.168.1.1 End: 192.168.1.10	None	Required

Destination IP address 2/3/4

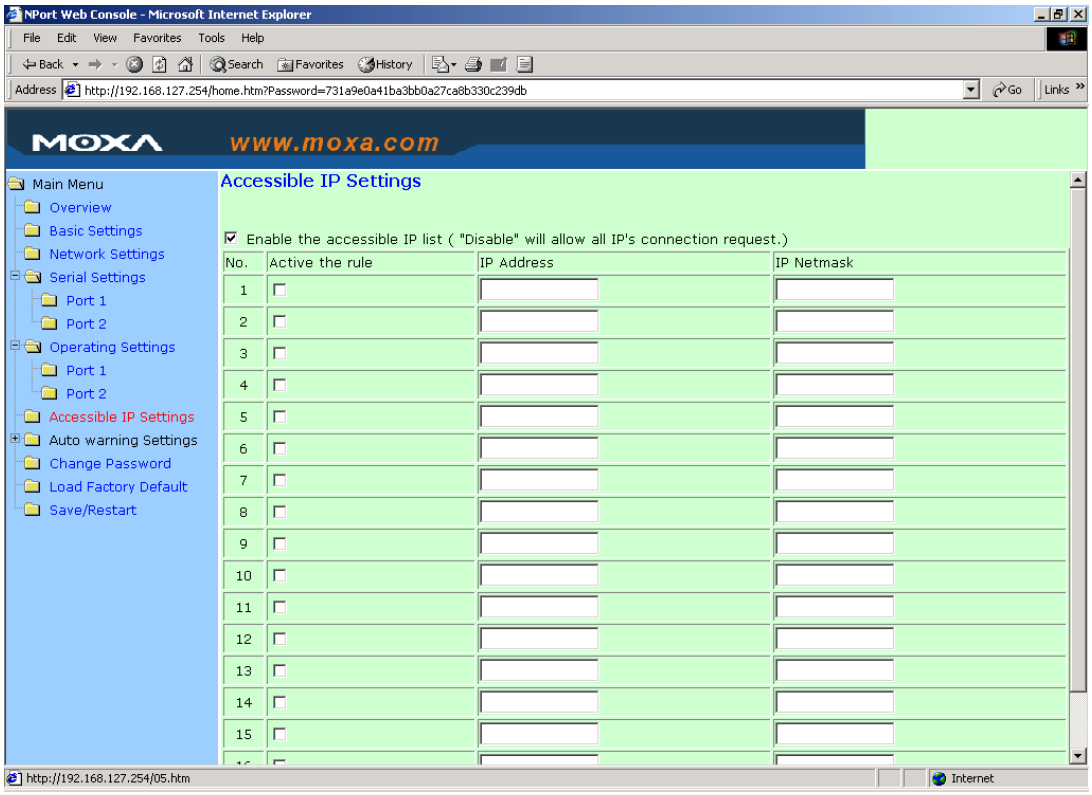
Setting	Factory Default	Necessity
IP address range E.g., Begin: 192.168.1.11 End: 192.168.1.20	None	Optional

Local listen port

Setting	Factory Default	Necessity
1 to 65535	4001	Required

The UDP port that NPort listens to, and that other devices must use to contact NPort. To avoid conflicts with well known UDP ports, the default is set to 4001.

Accessible IP Settings



NPort has an IP address based filtering method to control access to the NPort.

Accessible IP Settings allows you to add or remove "Legal" remote host IP addresses to prevent unauthorized access. Access to NPorts is controlled by IP address. That is, if a host's IP address is in the accessible IP table, then the host will be allowed access to the NPort. You can allow one of the following cases by setting the parameter.

- **Only one host of specific IP address can access the NPort**

  Enter "IP address/255.255.255.255" (e.g., "192.168.1.1/255.255.255.255").

- **Hosts on the specific subnet can access the NPort**

  Enter "IP address/255.255.255.0" (e.g., "192.168.1.0/255.255.255.0").

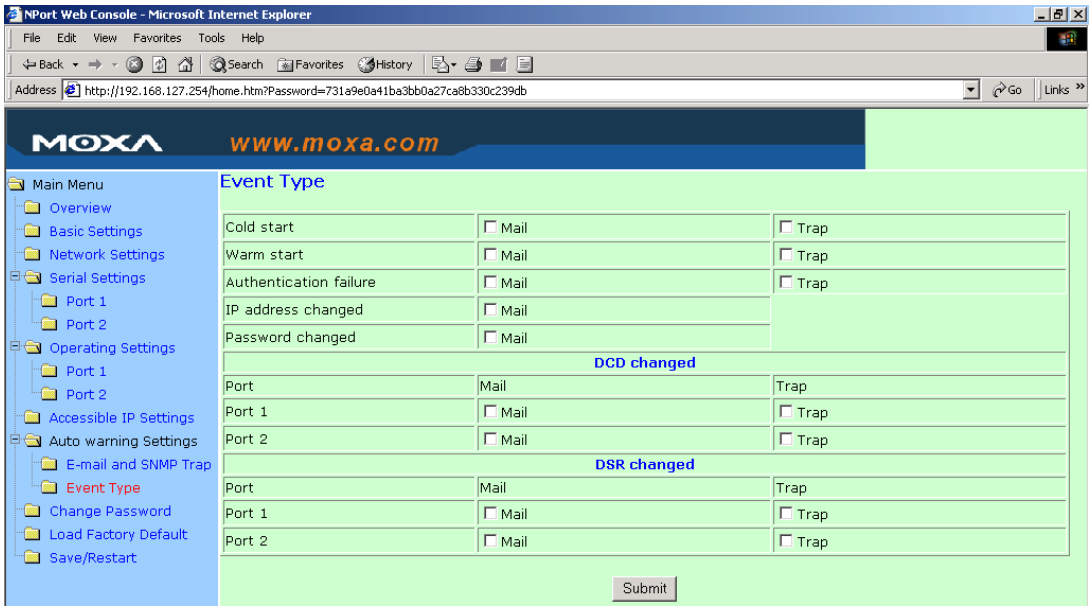
- **Any host can access the NPort**

  Disable this function. Refer to the following table for more details about the configuration example.

Allowable Hosts	Input format
Any host	Disable
192.168.1.120	192.168.1.120 / 255.255.255.255
192.168.1.1 to 192.168.1.254	192.168.1.0 / 255.255.255.0
192.168.0.1 to 192.168.255.254	192.168.0.0 / 255.255.0.0
192.168.1.1 to 192.168.1.126	192.168.1.0 / 255.255.255.128
192.168.1.129 to 192.168.1.254	192.168.1.128 / 255.255.255.128

Auto Warning Settings

Event Type



Cold start

This refers to starting the system from power off (contrast this with warm start). When performing a cold start, NPort will automatically issue an Auto warning message by e-mail, or send an SNMP trap after rebooting.

Warm start

This refers to restarting the computer without turning the power off. It's the opposite of cold start. When performing a warm start, NPort will automatically send an e-mail, or send an SNMP trap after rebooting.

Authentication failure

The user inputs a wrong password from the Console or Administrator. When authentication failure occurs, NPort will immediately send an e-mail or send an SNMP trap.

IP address changed

The user has changed NPort's IP address. When the IP address changes, NPort will send an e-mail with the new IP address before NPort reboots. If the NPort fails to send mail to the mail server after 15 seconds, NPort will be rebooting directly and abort the mail auto warning.

Password changed

The user has changed NPort's password. When the password changes, NPort will send an e-mail with the password change notice before NPort reboots. If the NPort fails to send mail to the mail server after 15 seconds, NPort will be rebooting directly and abort the mail auto warning.

DCD changed

The DCD (Data Carrier Detect) signal has changed, also indicating that the modem connection status has changed. For example, a DCD change to high also means "Connected" between local modem and remote modem. If the DCD signal changes to low, it also means that the connection line is down.

When the DCD changes, NPort will immediately send an e-mail or send an SNMP trap.

DSR changed

The DSR (Data Set Ready) signal has changed, also indicating that the data communication equipment's power is off. For example, a DSR change to high also means that the DCE is powered ON. If the DSR signal changes to low, it also means that the DCE is powered off.

When the DSR changes, NPort will immediately send an e-mail or send an SNMP trap.

Mail

Setting	Factory Default	Necessity
Enable, Disable	Disable	Optional

This feature helps the administrator manage the NPort. NPort sends mail to pre-defined mail boxes when the enabled events—such as Cold start, Warm start, Authentication failure, etc.—occur. To configure this feature, click on the event type box.

Trap

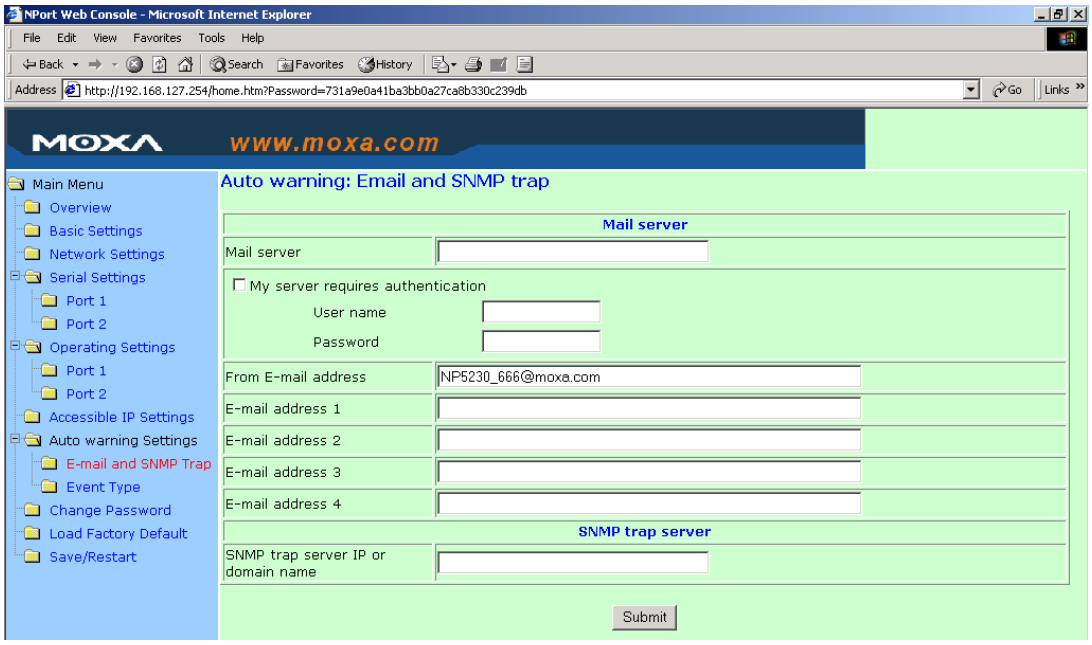
Setting	Factory Default	Necessity
Enable, Disable	Disable	Optional

This feature helps the administrator manage the NPort. NPort send SNMP Trap to a pre-defined SNMP Trap server when the enabled events—such as Cold start, Warm start, Authentication failure, etc.—occur. To configure this feature, you need to click on the event type box.

ATTENTION

DCD changed and **DSR changed** event only supported by those models, which have these two signals. For example NPort 5210, 5410 and NPort 5610.

Auto warning: E-mail and SNMP Trap



Mail Server

Mail Server

Setting	Factory Default	Necessity
IP or Domain Name	None	Optional

User Name

Setting	Factory Default	Necessity
1 to 15 characters	None	Optional

Password

Setting	Factory Default	Necessity
1 to 15 characters	None	Optional

From E-mail address

Setting	Factory Default	Necessity
1 to 63 characters	None	Optional

E-mail address 1/2/3/4

Setting	Factory Default	Necessity
1 to 63 characters	None	Optional

ATTENTION

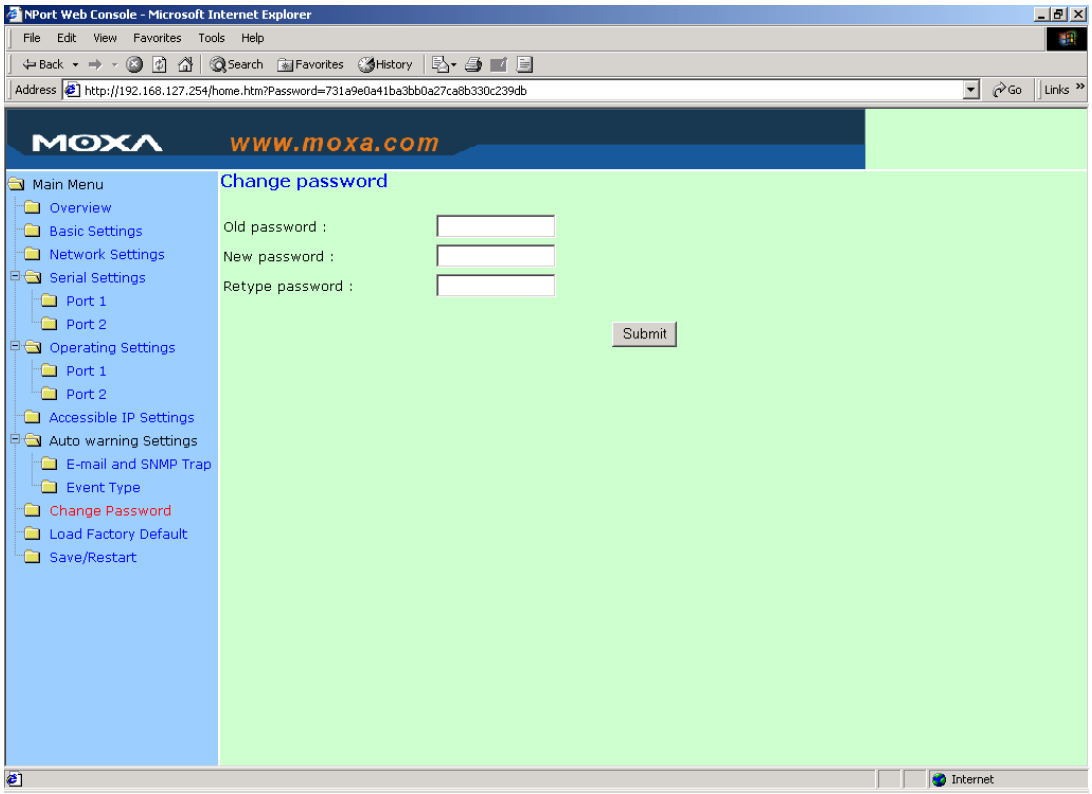
Consult your Network Administrator or ISP for the proper mail server settings. Auto warning function may not work properly without proper settings. NPort SMTP AUTH support LOGIN, PLAIN, CRAM-MD5 (RFC 2554).

SNMP Trap Server

SNMP trap server IP or domain name

Setting	Factory Default	Necessity
IP or Domain Name	None	Optional

Change Password

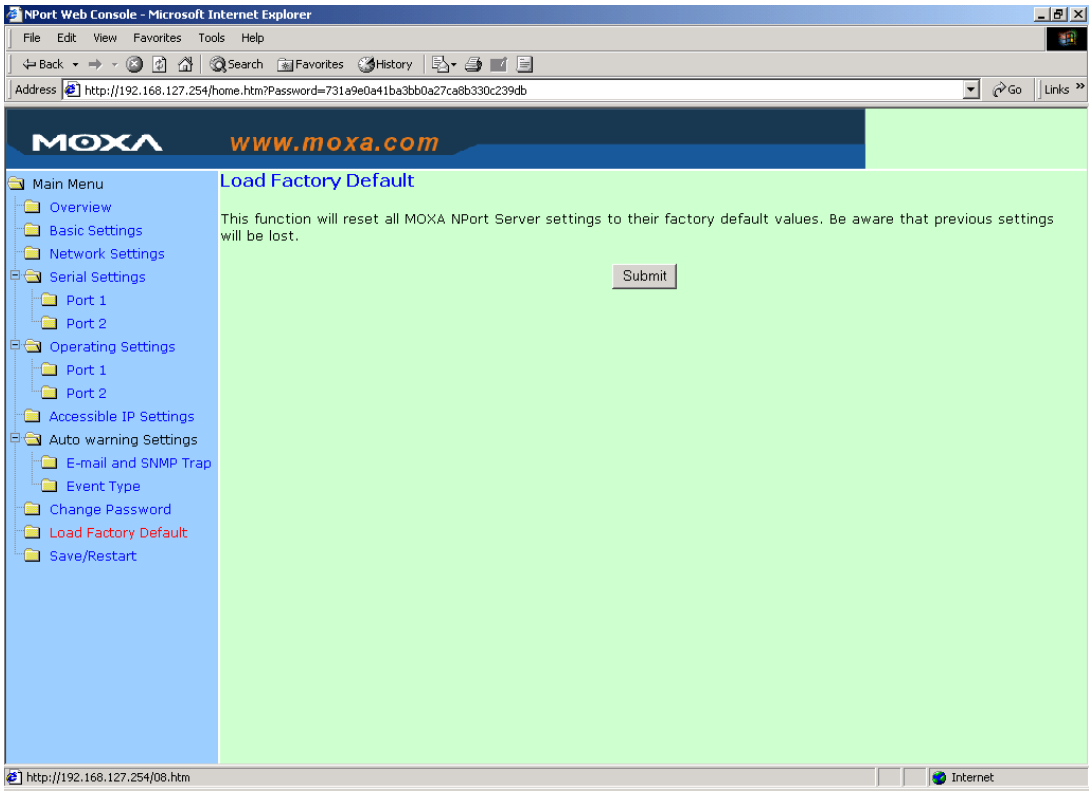


Input the "Old password" and "New password" to change the password. Leave the password boxes blank to erase the password. In this case, the NPort will not have password protection.

ATTENTION

If your forget the password, the ONLY way to configure NPort is by using the Reset button on NPort's casing to "Load Factory Default."
Remember to export the configuration file using Windows Administrator when you finish the configuration. By using the Import function of Windows Administrator, your configuration can be re-loaded into NPort after using "Load Factory Default." Refer to Chapter 6 for more details about the Export and Import function.

Load Factory Default



This function will reset all of NPort's settings to the factory default values. Be aware that previous settings will be lost.

6

Configuring Windows Administrator

This chapter use NPort 5230 as an example to introduce the installation and configuration of NPort Administration Suite. The function and definition is totally the same with NPort 5400 series. The following topics are covered in this chapter:

- **Overview**
- **Installing Windows Administrator**
- **Configuration**
- **Monitor**
- **Port Monitor**
- **COM Mapping**
- **IP Location**

Overview

We understand the importance of software as the foundation of your application, and with this in mind, we designed NPort Administrator to let you easily install and configure your NPort 5000 Series product over the network. NPort Administrator provides five function groups that ease the installation process, allows off-line COM mapping, and provides monitoring and IP location server functions.

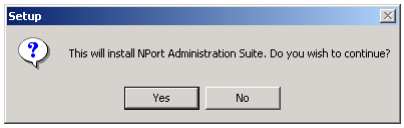
NPort Administrator is an integrated software suite that bundles NPort Administrator and the IP Serial Library, and provides everything you need to remotely manage, monitor, and modify your NPort—hassle free.

ATTENTION

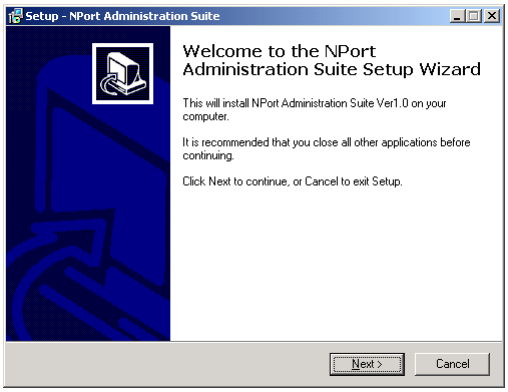
NPort Administrator ONLY supports NPort 5000 Series products. For the NPort DE-311 or DE-211, use NPort Management Suite, which can be downloaded from www.moxa.com.

Installing Windows Administrator

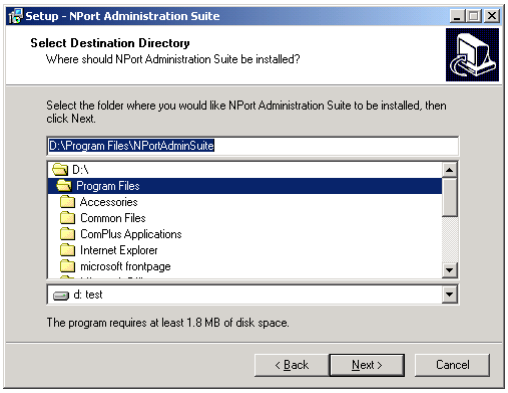
1. Once the Setup program starts running, click on **Yes** to proceed.



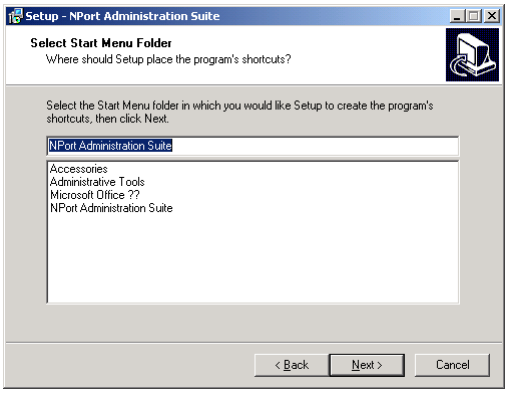
2. Click on **Next** when the **Welcome** window opens to proceed with the installation.


Setup - NPort Administration Suite
Welcome to the NPort Administration Suite Setup Wizard
This will install NPort Administration Suite Ver1.0 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

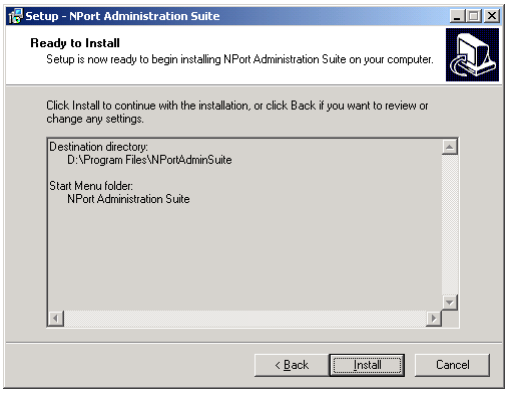
3. Click on **Next** to install program files in the default directory, or select an alternative location.



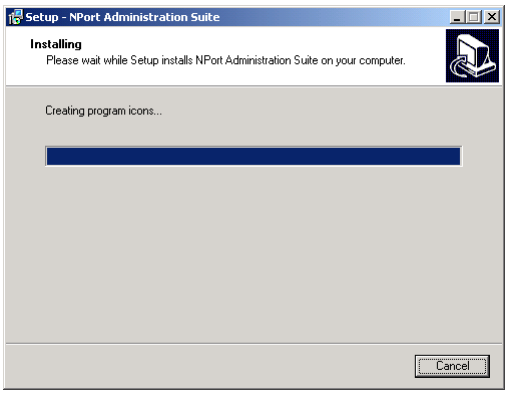
4. Click on **Next** to install the program using the default program name, or select a different name.


Setup - NPort Administration Suite
Select Start Menu Folder
Where should Setup place the program's shortcuts?
Select the Start Menu folder in which you would like Setup to create the program's shortcuts, then click Next.
NPort Administration Suite
Accessories
Administrative Tools
Microsoft Office ??
NPort Administration Suite
< Back
Next >
Cancel

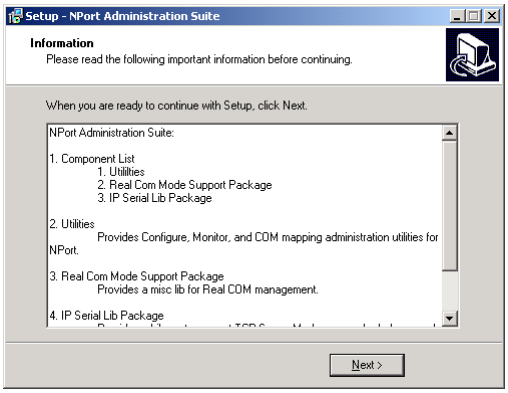
5. Click on **Install** to proceed with the installation.


Setup - NPort Administration Suite
Ready to Install
Setup is now ready to begin installing NPort Administration Suite on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination directory:
D:\Program Files\NPortAdminSuite
Start Menu folder:
NPort Administration Suite
< Back
Install
Cancel

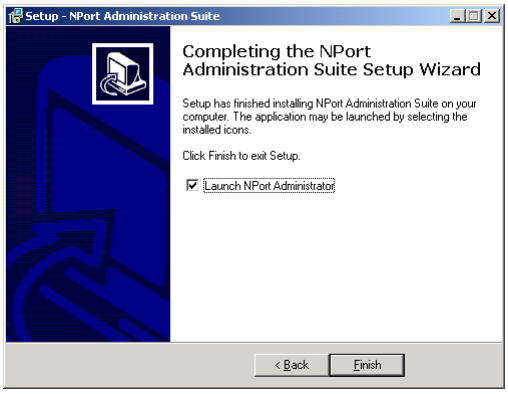
6. The **Installing** window reports the progress of the installation.


Setup - NPort Administration Suite
Installing
Please wait while Setup installs NPort Administration Suite on your computer.
Creating program icons...
Cancel

7. Click on **Next** to proceed with the installation.


Setup - NPort Administration Suite
Information
Please read the following important information before continuing.
When you are ready to continue with Setup, click Next.
NPort Administration Suite:
1. Component List
1. Utilities
2. Real Com Mode Support Package
3. IP Serial Lib Package
2. Utilities
Provides Configure, Monitor, and COM mapping administration utilities for NPort.
3. Real Com Mode Support Package
Provides a misc lib for Real COM management.
4. IP Serial Lib Package
Next >

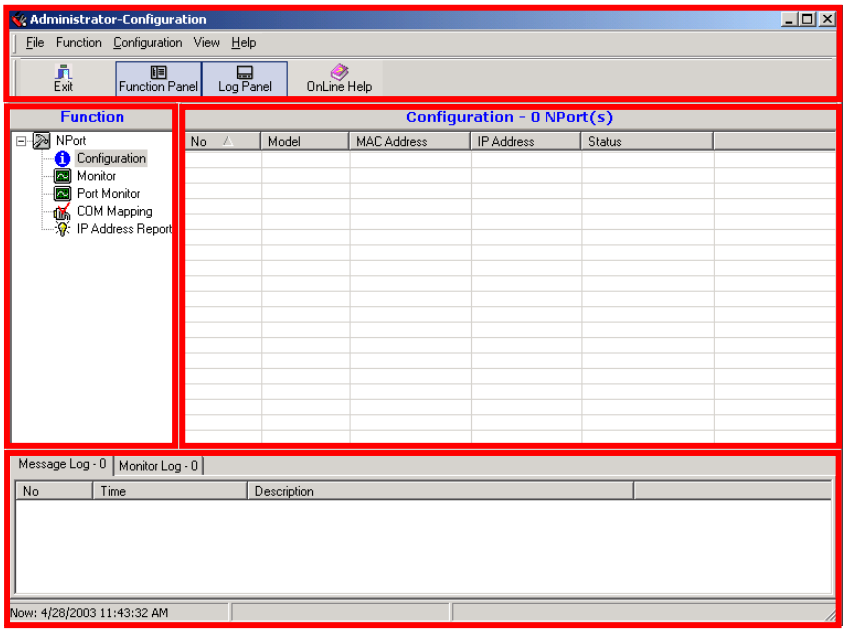
8. Click on **Finish** to complete the installation of NPort Administration Suite.


Setup - NPort Administration Suite
Completing the NPort Administration Suite Setup Wizard
Setup has finished installing NPort Administration Suite on your computer. The application may be launched by selecting the installed icons.
Click Finish to exit Setup.
Launch NPort Administrator
< Back
Finish

Configuration

The Administrator-Configuration window is divided into four parts.

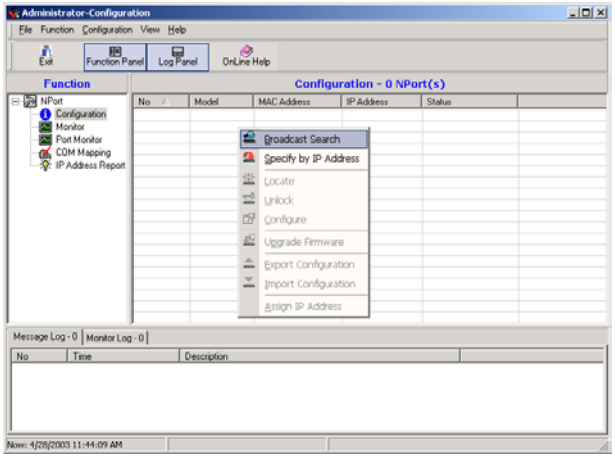
- The top part is the function list and online help area. (Windows NT does not support this .chm file format.)
- The left part lists the five Administrator function groups.
- The right part provides the NPort list, which can be selected to process user requirements.
- The bottom part is the Log area, which shows useful messages that record the user's processing history.



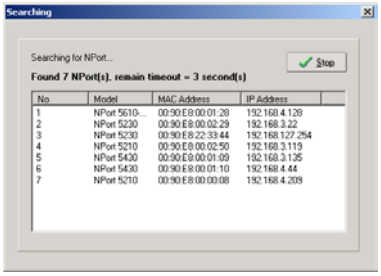
Broadcast Search

The **Broadcast Search** function is used to locate all NPorts that are connected to the same LAN as your computer.

Since the Broadcast Search function searches by MAC address and not IP address, all NPorts connected to the LAN will be located, regardless of whether or not they are part of the same subnet as the host.

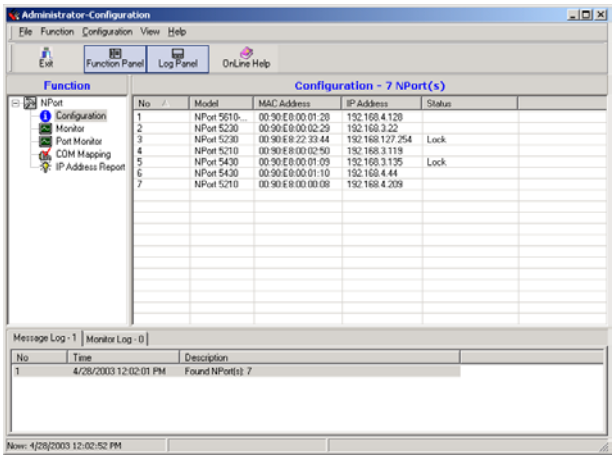


The Broadcast Search window will open and display the Model, IP Address, MAC Address, and Progress (of the search for that particular device).



When the search is complete, the Broadcast Search window closes, and the NPorts that were located are displayed in the right pane of the Administrator window.
For the example shown here, NPort Administrator found 7 NPort Serial Device Servers on the LAN. As you can see, 2 of the 7 NPorts have password protection, which is indicated by **Lock** under **Status**.

To configure one of the listed NPorts, place the cursor over the row displaying that NPort's information, and then double click.

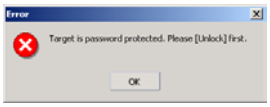


ATTENTION

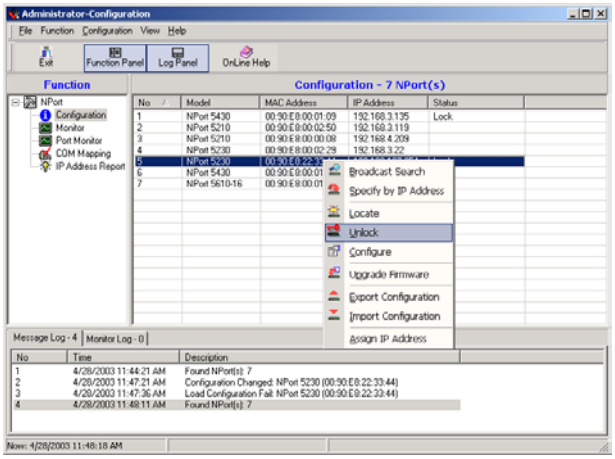
Before modifying an NPort's configuration, use **Broadcast Search** or **Specify by IP Address** to locate NPorts connected to the LAN.

Unlock Password Protection

If the NPort is password protected, then you will not be able to use the right click or double click method to open the configuration page.

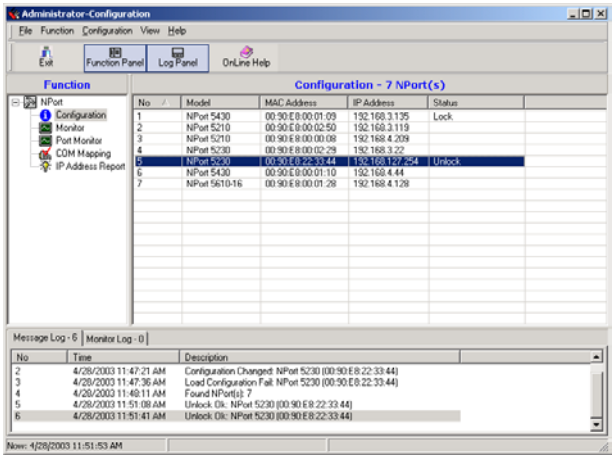


Instead, select an NPort with "Lock" status, right click the locked NPort, and then select the unlock button.



After inputting the correct password, the Administrator will display a message box as shown here.

The previous "Lock" status will switch to "Unlock" status.
Administrator will keep this NPort in the Unlock status throughout this Administrator session.



The meanings of the six states are as follows (note that the term Fixed is borrowed from the standard fixed IP address networking terminology):

Lock
The NPort is password protected, "Broadcast Search" was used to locate it, and the password has not yet been entered from within the current Administrator session.

Unlock
The NPort is password protected, "Broadcast Search" was used to locate it, and the password has been entered from within the current Administrator session. Henceforth during this Administrator session, activating various utilities for this NPort will not require re-entering the server password.

Blank
The NPort is not password protected, and "Broadcast Search" was used to locate it.

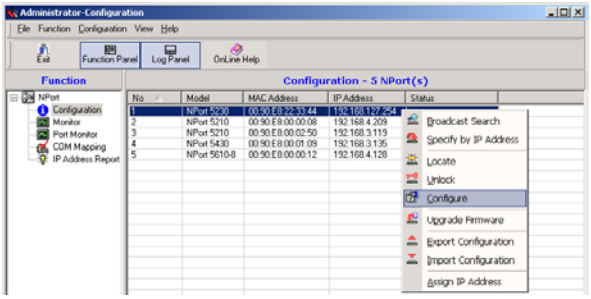
Fixed
The NPort is not password protected, and "Search by IP address" was used to locate it.

Lock Fixed
The NPort is password protected, "Specify by IP address" was used to locate it, and the password has not yet been entered from within the current Administrator session.

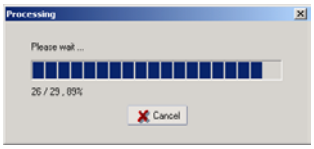
Unlock Fixed
The NPort is password protected, "Specify by IP address" was used to locate it, and the password has been entered from within the current Administrator session. Henceforth during this Administrator session, activating various utilities for this NPort will not require re-entering the server password.

Configuring NPort 5410/5430/5340I

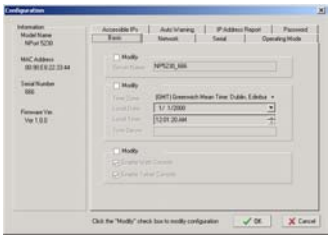
Input the password to Unlock the NPort. Right click on a specific NPort and select configure to start the configuration.

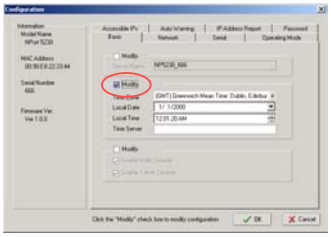


The progress bar shows that Administrator is retrieving configuration information from the specific NPort.



Refer to Chapter 5 for each parameter's function definition.
To modify the configuration, you must first click in the modify box to activate the parameter setting box.





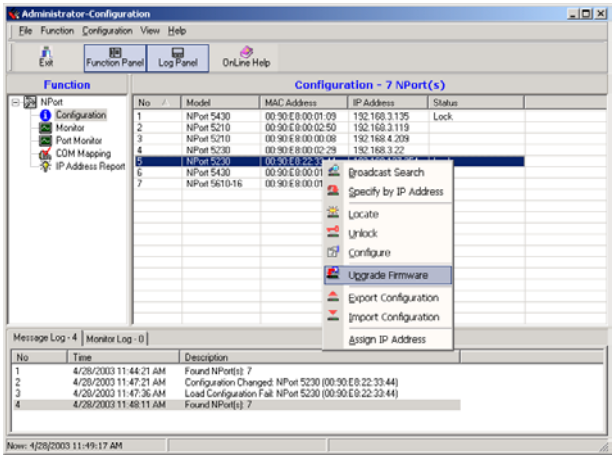
ATTENTION

You can simultaneously modify the configurations of multiple NPorts that are of the same model.

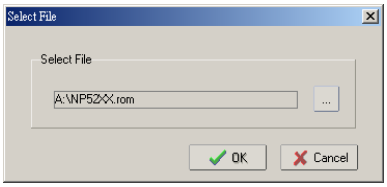
To select multiple NPorts, hold down the Ctrl key when selecting additional NPorts, or hold down the Shift key to select a group of NPorts.

Upgrade Firmware

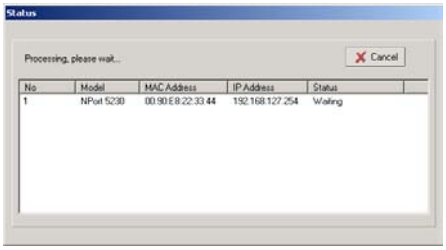
Input the password to Unlock the NPort, and then right click on a specific NPort and select the Upgrade Firmware function to start upgrading the firmware.



Select the correct ROM file to be downloaded to the NPort. Visit Moxa's website at www.moxa.com for the latest firmware release.



Wait patiently while the Upgrade Firmware action is being processed.



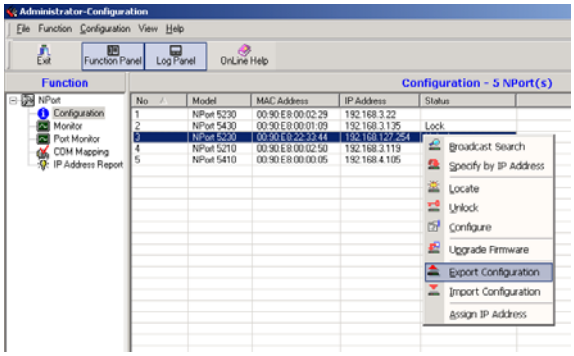
ATTENTION

You can simultaneously upgrade the firmware of multiple NPorts that are of the same model.

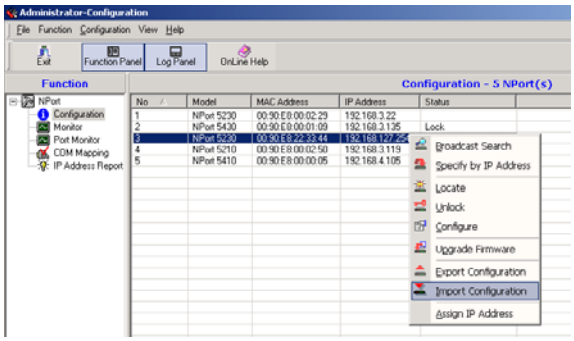
To select multiple NPorts, hold down the Ctrl key when selecting an additional NPort, or hold down the Shift key to select a block of NPorts.

Export/Import

Right click on a specific NPort and select the Export function to start Exporting the configuration file.
The Export Configuration function is a handy tool that can be used to produce a text file containing the current configuration of a particular NPort.



The Import Configuration function is used to import an NPort configuration from a file into one or more of the same model NPort.
To import a configuration, first select the target servers (use the left mouse button to select servers; simply hold down the Ctrl key when selecting the second, third, etc., NPort).



ATTENTION

You can simultaneously import the same configuration file into multiple NPorts that are of the same model.

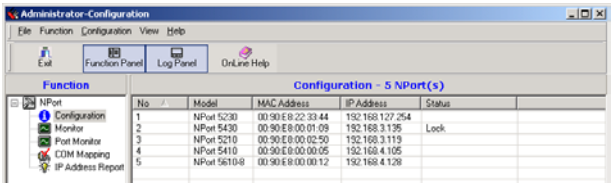
To select multiple NPorts, hold down the Ctrl key when selecting an additional NPort, or hold down the Shift key to select a block of NPorts.

Monitor

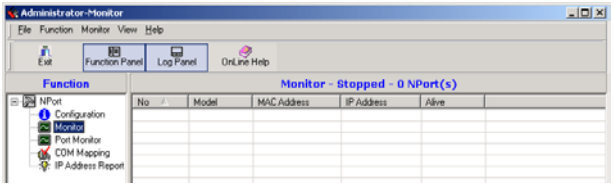
There are two methods available to start the Monitor function.

1. First use **Broadcast Search** under the Configuration Function group, and then click on **Monitor → Add Target → Select target** from the list.
2. First click on **Monitor**, and then **Add Target → Rescan**.

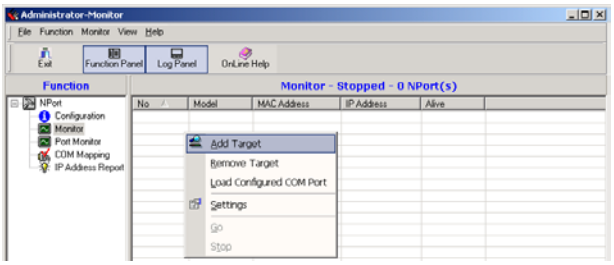
Select Broadcast under the Configuration function group.



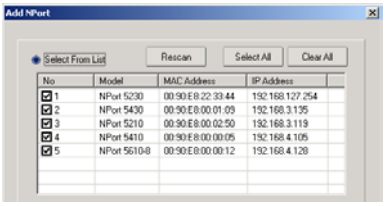
Click on Monitor.



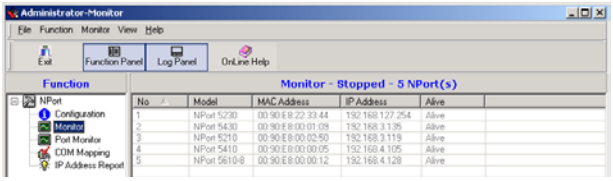
Select Add Target.



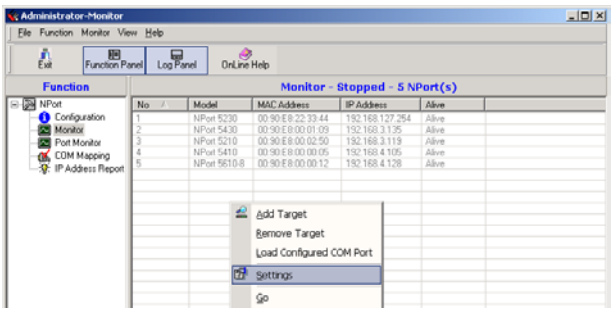
When you select add target, you will see an NPort list that looks the same as when using Configuration → Broadcast Search. Check the NPort you would like to Monitor, and then click OK.



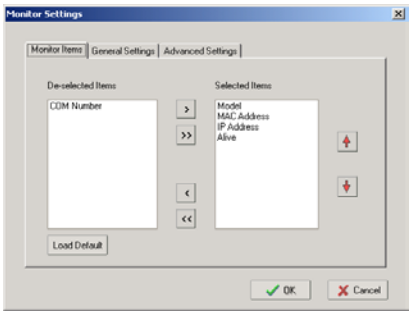
The NPort list will now appear on the Monitor screen.



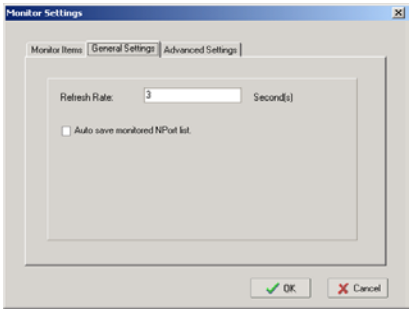
Right click the panel and select Settings.



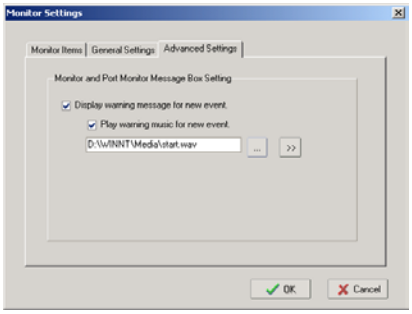
Select Monitor Items.



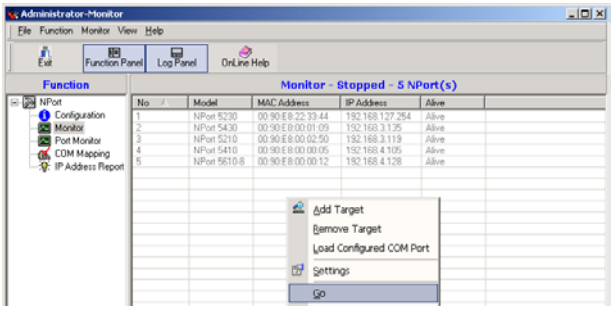
Select a Refresh Rate (the default is 3 seconds).



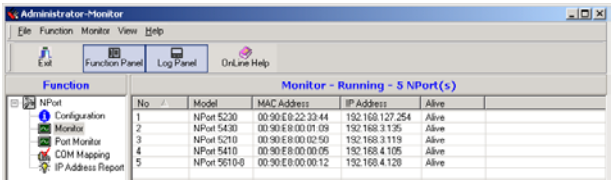
Select Display warning message or Play the warning music in WAV format when a new event occurs.
New event means one of the NPorts in the monitor is "Alive" or "Not Alive," or has lost connection with the Monitor program.



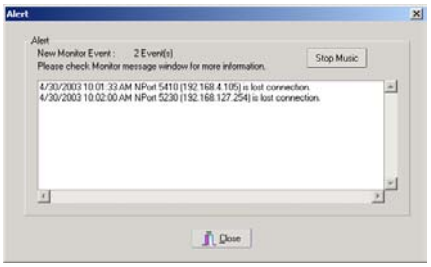
Press Go to start Monitor.



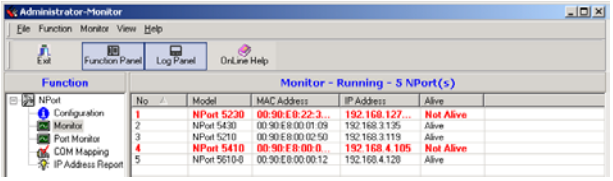
In this example, the 5 NPorts shown in the list will be monitored.



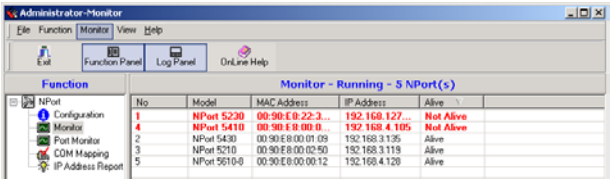
When one of the NPorts loses connection with the Monitor program, a warning alert will display automatically. The warning music will be played at the same time.


Alert
Alert
New Monitor Event : 2 Event(s)
Please check Monitor message window for more information.
Stop Music
4/30/2003 10:01:33 AM NPort 5410 [192.168.4.105] is lost connection.
4/30/2003 10:02:00 AM NPort 5230 [192.168.127.254] is lost connection.
Close

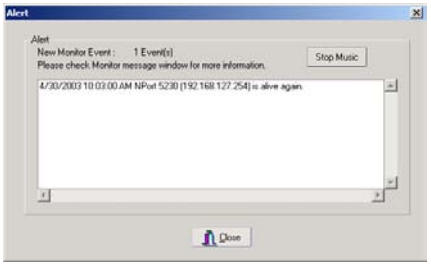
In the Monitor screen, you can see the "Not Alive" NPort is marked with red color.



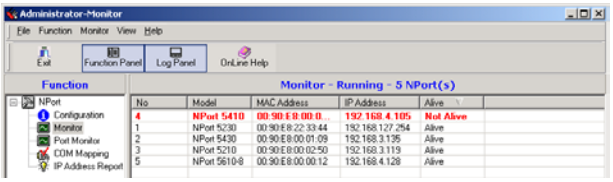
Click the Alive column. The Monitor program will sort the NPort list and put all "Not Alive" NPorts at the top of the list.



If the NPort gets reconnected, a warning will be displayed to remind the user the NPort is now "Alive."

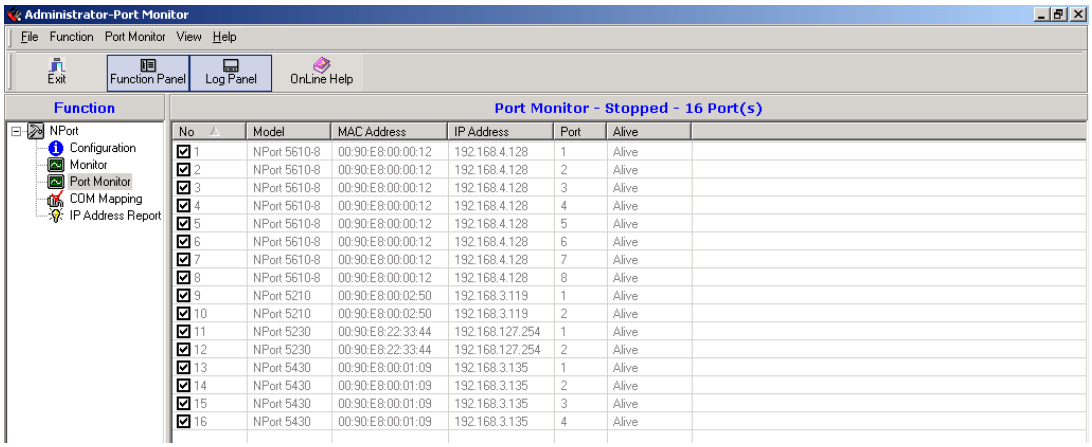

Alert
Alert
New Monitor Event : 1 Event(s)
Please check Monitor message window for more information.
Stop Music
4/30/2003 10:03:00 AM NPort 5230 [192.168.127.254] is alive again.
Close

The NPort that was reconnected will again, and is now "Alive," will be shown with black color.

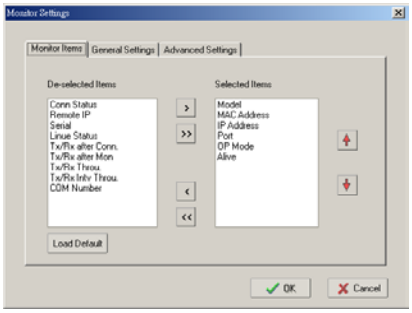


Port Monitor

The process is the same as in the previous “Monitor” section. The only difference is that you can select more items under Port Monitor than under port status.



Select the Monitor Items.



COM Mapping

Windows Administration Suite comes with the Windows 95/98/ME/NT/2000/XP Real COM drivers. After you install Windows Administration Suite, there are two ways to set up the NPort's serial port as your host's remote COM port.

The first way is **On-line COM Mapping**. On-line COM Mapping will check to make sure the NPort is correctly connected to the network and then install the driver on the host computer.

The second way is **Off-line COM Installation**, without connecting the NPort to the network first. Off-line COM Mapping can decrease the system integrator's effort by solving different field problems. Via off-line installation, user can process the host software installation and then install the NPort to different fields.

Use the following procedure to map COM ports:

1. On-line COM Mapping:

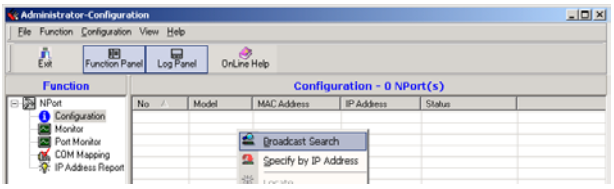
   Connect NPort to the network → Set NPort to the proper IP address → Map COMs to your host → Apply Change.

2. Off-line COM Mapping:

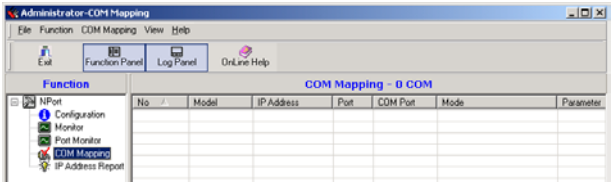
   Map COMs to your host → Apply Change → Connect NPort to the network → Configure NPort's IP address.

On-line COM Mapping

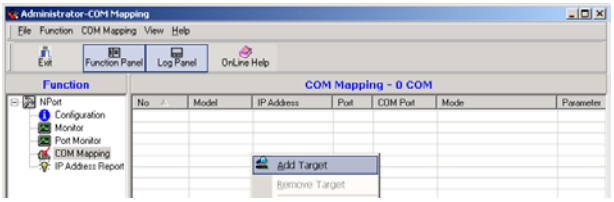
Broadcast Search for NPorts on the network.



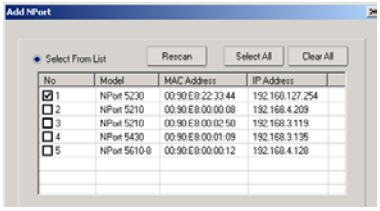
Select the COM Mapping function group.



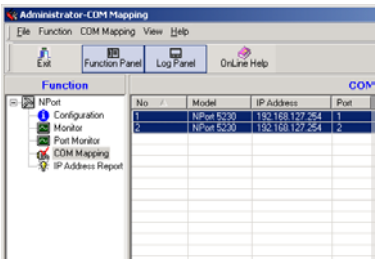
Add the target you would like to map COM ports to.



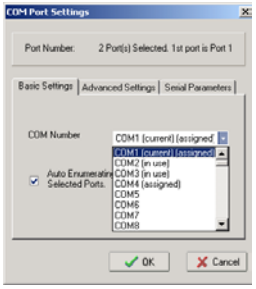
The NPort list that appears will be based on the Broadcast Search on the Configuration. Select the NPort you want to map COM ports to.

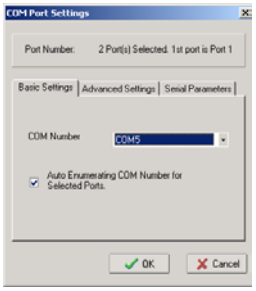


Select **COM Setting** to modify COM No., default setting, etc.



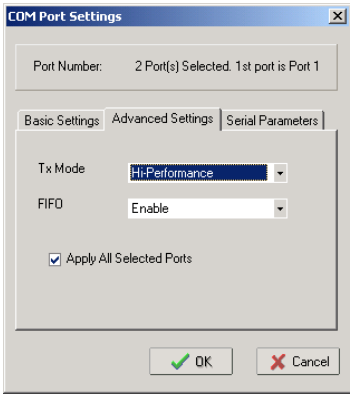
Select the COM No.
Those “In use,” “Assigned” COM ports will also be indicated in this dialog window.
If you select multiple serial ports or multiple NPorts, remember to check the “Auto Enumerating” function to use the COM No. you select to be the first COM No.





Hi-performance mode is the default for Tx mode. If the driver completes sending data out to the NPort, the driver will respond Tx Empty to the program.

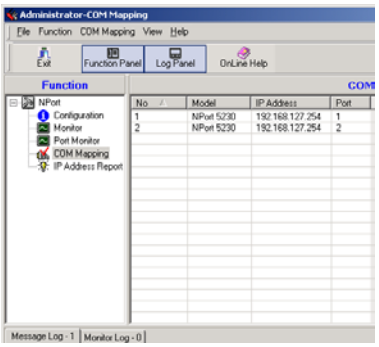
But, under **"classical mode"**, the driver will not notify the user’s program that Tx is completed until all Tx data has been sent out from the NPort; this mode will cause lower throughput.
If you want to make sure all data is sent out before further processing, classical mode is recommended.



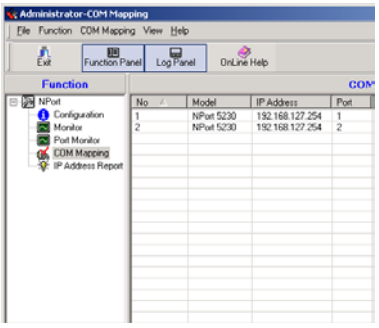
Enable/Disable Tx/Rx FIFO. If disabled, NPort will send one byte each time the Tx FIFO becomes empty; and Rx interrupt will be generated for each incoming byte. This will cause faster response and lower throughput. If you want to use XON/XOFF flow control, we recommend setting FIFO to Disable.

The Serial Parameter settings shown here are the default settings when the NPort is powered on.
The program can define the serial parameter after the program opens the port via Win32API with the specific serial parameters.

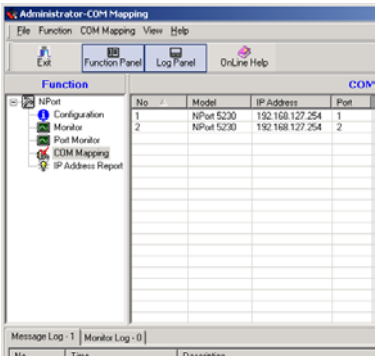
After setting the COM Mapping, remember to select the **Apply Change** to save the information in the host system registry. The host computer will not have the ability to use the COM port until after selecting Apply Change.

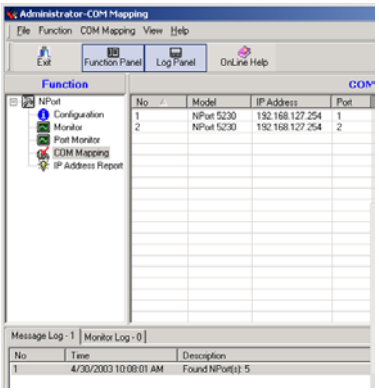


Select **Discard Change** to tell Administrator to NOT save the COM Mapping information to the host.



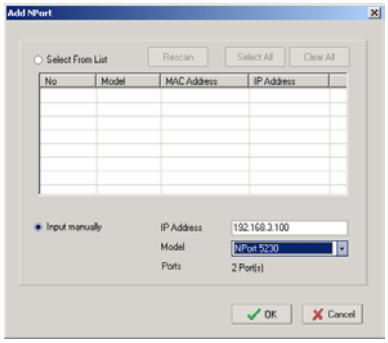
To save the configuration to a text file, select **Export COM Mapping**. You will then be able to import this configuration file to another host and use the same COM Mapping settings in the other host.

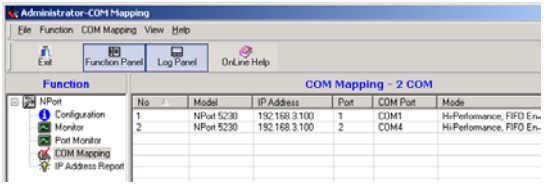




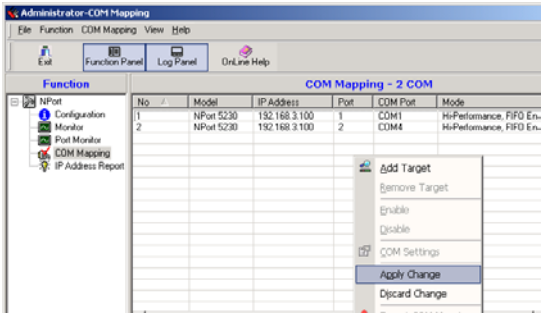
Off-line COM Mapping

Add a target by inputting the IP address and selecting the Model Name without physically connecting the NPort to the network.





Apply change.

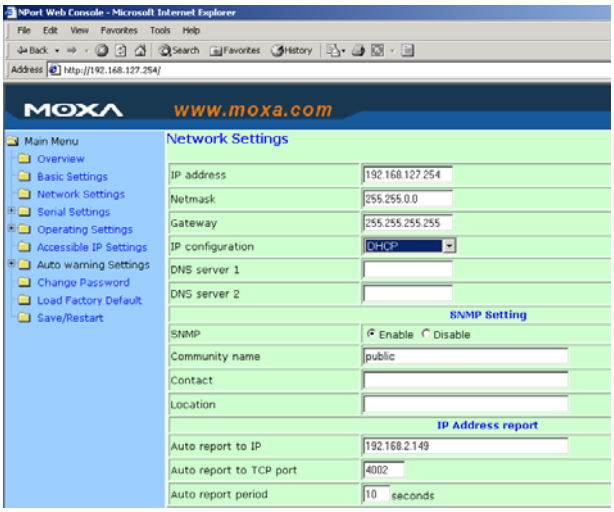


IP Location

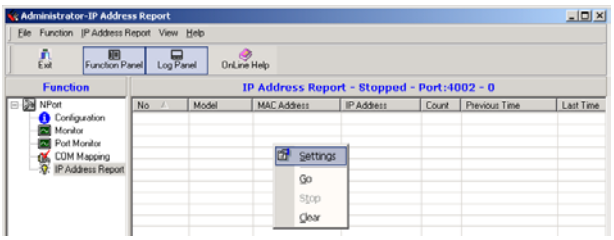
When NPort 5000 series products are used in a dynamic IP environment, users must spend more time with IP management tasks. NPort 5000 series products help out by periodically reporting their IP address to the IP location server, in case the dynamic IP has changed.

- Receive NPort's IP location report
- Centralize NPort's IP management in a dynamic IP environment.

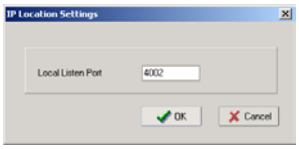
Configure NPort with Dynamic IP settings. For example, DHCP, BootP and DHCP/BootP.
Assign the remote Auto IP report server's IP address and TCP port.



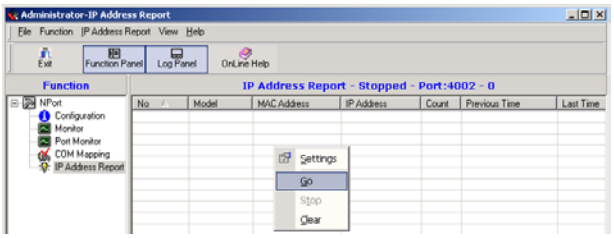
Select the IP Location Report.

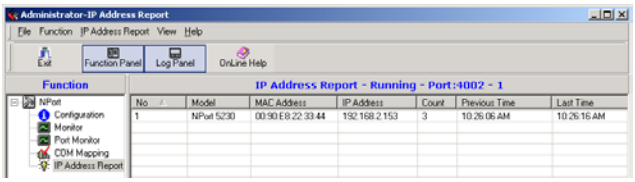


The configure the local listen to be the same as the NPort's "Auto report to TCP port" setting.



Press Go to start receiving the Auto IP address report from the NPort.





7

IP Serial LIB

The following topics are covered in this chapter:

- **Overview**
- **IP Serial LIB Function Groups**
- **Example Program**

Overview

What is IP Serial Library?

IP Serial Library is a Windows library with frequently used serial command sets and subroutines. IP Serial Library is designed to reduce the complexity and poor efficiency of serial communication over TCP/IP. For example, Telnet can only transfer data, but it can't monitor or configure the serial line's parameters.

Why Use IP Serial Library?

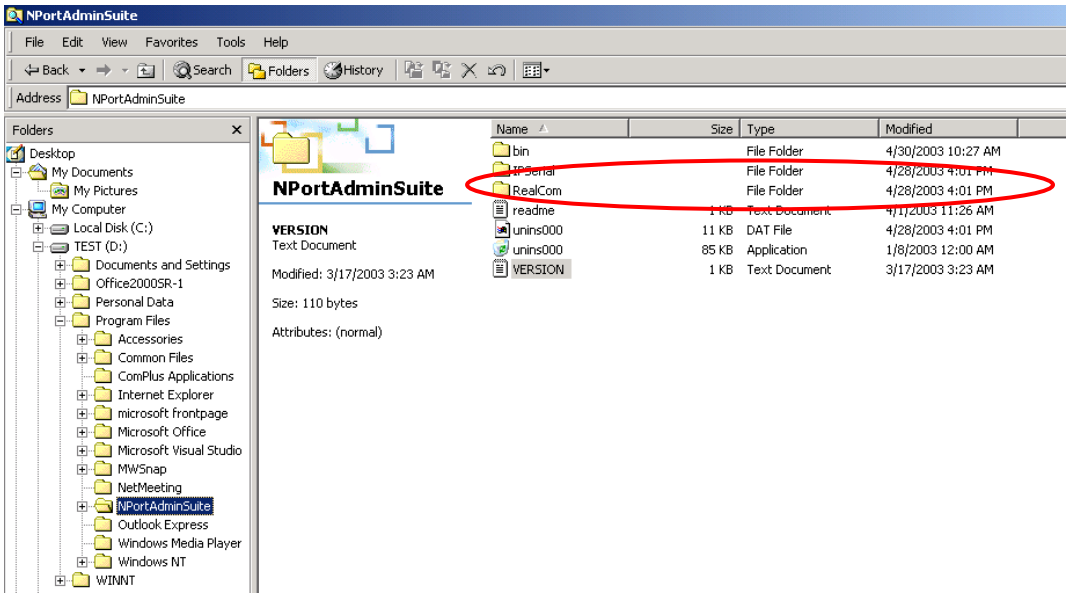
For programmers who are familiar with serial communication, IP Serial Library provides well-designed function calls that have the same style as Moxa's PComm Library.

IP Serial Library is amazingly simple and easy to understand. By including it in your VB, C, or Delphi programming environment, you can program your own TCP/IP application with the ability to control serial communication parameters.

NPort Serial Device Servers use 2 TCP ports for communication between the NPort and host computer's Real COM driver. NPort uses a data port and command port to provide pure data transfer without decode and encode. Compared to using only one TCP port to control serial communication (such as RFC 2217), IP Serial Library uses a command port to communicate with NPort in user's program. IP Serial Library not only runs with excellent efficiency but also runs without any decode or encode problems.

How to install IP Serial Library?

IP Serial Lib comes with the NPort Administration Suite. Refer to the IPSerial directory for more detail about the function definitions.



IP Serial LIB Function Groups

Server Control	Port Control	Input/Output Data	Port Status Inquiry	Miscellaneous
nsio_init	nsio_open	nsio_read	nsio_lstatus	nsio_break
nsio_end	nsio_close	nsio_SetReadTimeouts	nsio_data_status	nsio_break_on
nsio_resetserver	nsio_ioctl	nsio_write		nsio_break_off
nsio_checkalive	nsio_flowctrl	nsio_SetWriteTimeouts		nsio_breakcount
	nsio_DTR			
	nsio_RTS			
	nsio_lctrl			
	nsio_baud			
	nsio_resetport			

Example Program

```
char NPortip=”192.168.1.10”;
char buffer[255];                                          /*data buffer, 255 chars */
int port = 1;                                              /*1st port */
int portid;                                                /* port handle */
nsio_init();                                               /*initial IP Serial Library */
portid = nsio_open(NPortip, port);                         /*1st port, NPort IP=192.168.1.10 */
nsio_ioctl(portid, B9600, (BIT_8 | STOP_1 | P_NONE) );     /*set 9600, N81 */
sleep(1000);                                               /* wait for 1000 ms for data */
nsio_read(port, buffer, 200);                              /* read 200 bytes from port 1 */
nsio_close(portid);                                        /* close this serial port */
nsio_end();                                                /* close IP Serial Library */
```

A

Pinouts and Cable Wiring

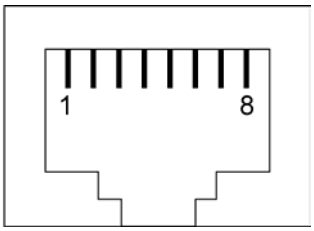
In this appendix, we cover the following topics.

- **Port Pinout Diagrams**
  - Ethernet Port Pinouts
  - Serial Port Pinouts
- **Cable Wiring Diagrams**
  - Ethernet Cables
  - Serial Cables

Port Pinout Diagrams

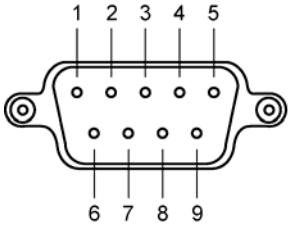
Ethernet Port Pinouts

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-



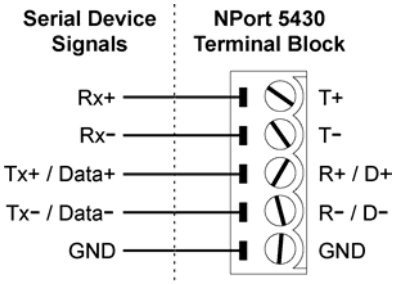
Serial Port Pinouts

DB9 Male RS-232 Port Pinouts for NPort 5410



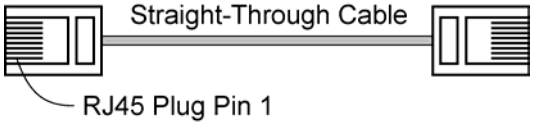
PIN	RS-232 Signal
1	DCD (in)
2	RxD (in)
3	TxD (out)
4	DTR (out)
5	GND
6	DSR (in)
7	RTS (out)
8	CTS (in)
9	---

Terminal Block RS-232 & RS-422/485 Pinouts for NPort 5230



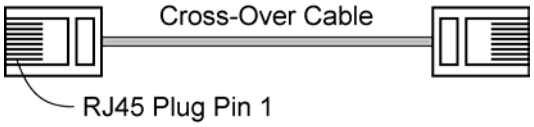
Cable Wiring Diagrams

Ethernet Cables



Cable Wiring

3	3
6	6
1	1
2	2

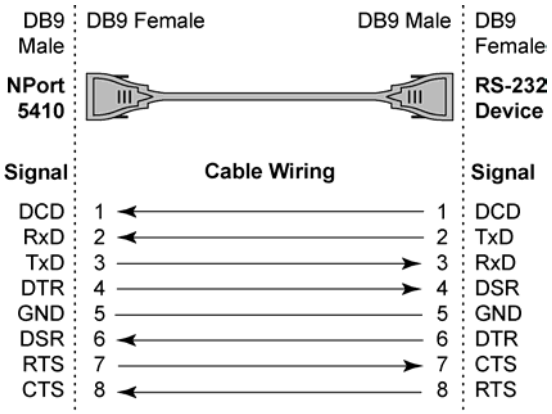


Cable Wiring

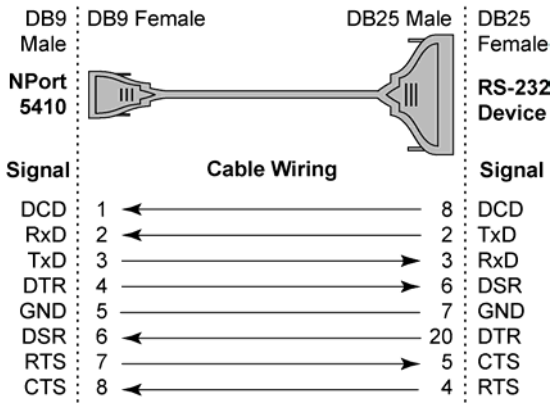
3	1
6	2
1	3
2	6

Serial Cables

DB9 Female to DB9 Male for NPort 5410



DB9 Female to DB25 Male for NPort 5410



B

Well Known Port Numbers

This appendix is for your reference about the Well Known port numbers that may cause network problem if you set NPort into the same port. Refer to RFC 1700 for Well Known port numbers of refer to the following introduction from the IANA.

The port numbers are divided into three ranges: the Well Known Ports, the Registered Ports, and the Dynamic and/or Private Ports.

The Well Known Ports are those from 0 through 1023.

The Registered Ports are those from 1024 through 49151.

The Dynamic and/or Private Ports are those from 49152 through 65535.

The Well Known Ports are assigned by the IANA, and on most systems, can only be used by system processes or by programs executed by privileged users. The following table shows famous port numbers among the well-known port numbers. For more details, please visit IANA website:

http://www.iana.org/assignments/port-numbers

TCP Socket	Application Service
0	reserved
1	TCP Port Service Multiplexor
2	Management Utility
7	Echo
9	Discard
11	Active Users (systat)
13	Daytime
15	Netstat
20	FTP data port
21	FTP CONTROL port
23	Telnet
25	SMTP (Simple Mail Transfer Protocol)
37	Time (Time Server)
42	Host name server (names server)
43	Whois (nickname)

49	(Login Host Protocol) (Login)
53	Domain Name Server (domain)
79	Finger protocol (Finger)
TCP Socket	**Application Service**
80	World Wibe Web HTTP
119	Netword news Transfer Protocol (NNTP)
123	Network Time Protocol
213	IPX
160 – 223	Reserved for future use

UDP Socket	**Application Service**
0	reserved
2	Management Utility
7	Echo
9	Discard
11	Active Users (systat)
13	Daytime
35	Any private printer server
39	Resource Location Protocol
42	Host name server (names server)
43	Whois (nickname)
49	(Login Host Protocol) (Login)
53	Domain Name Server (domain)
69	Trivial Transfer Protocol (TETP)
70	Gopler Protocol
79	Finger Protocol
80	World Wide Web HTTP
107	Remote Telnet Service
111	Sun Remote Procedure Call (Sunrpc)
119	Network news Tcanster Protocol (NNTP)
123	Network Time protocol (nnp)
161	SNMP (Simple Network Mail Protocol)
162	SNMP Traps
213	IPX (Used for IP Tunneling)

C

SNMP Agent with MIB II & RS-232 like group

NPort 5200 has a built-in SNMP (Simple Network Management Protocol) agent software. It supports SNMP Trap, RFC1317 RS-232 like gourp and RFC 1213 MIB-II. The following table lists the standard MIB-II group, as well as the variable implementation for NPort 5200.

RFC1213 MIB-II supported SNMP variables:

System MIB	Interfaces MIB	IP MIB	ICMP MIB
SysDescr	itNumber	ipForwarding	IcmpInMsgs
SysObjectID	ifIndex	ipDefaultTTL	IcmpInErrors
SysUpTime	ifDescr	ipInreceives	IcmpInDestUnreachs
SysContact	ifType	ipInHdrErrors	IcmpInTimeExcds
SysName	ifMtu	ipInAddrErrors	IcmpInParmProbs
SysLocation	ifSpeed	ipForwDatagrams	IcmpInSrcQuenchs
SysServices	ifPhysAddress	ipInUnknownProtos	IcmpInRedirects
	ifAdminStatus	ipInDiscards	IcmpInEchos
	ifOperStatus	ipInDelivers	IcmpInEchoReps
	ifLastChange	ipOutRequests	IcmpInTimestamps
	ifInOctets	ipOutDiscards	IcmpTimestampReps
	ifInUcastPkts	ipOutNoRoutes	IcmpInAddrMasks
	ifInNUcastPkts	ipReasmTimeout	IcmpOutMsgs
	ifInDiscards	ipReasmReqds	IcmpOutErrors
	ifInErrors	ipReasmOKs	IcmpOutDestUnreachs

System MIB	Interfaces MIB	IP MIB	ICMP MIB
SysServices	ifInUnknownProtos	ipReasmFails	IcmpOutTimeExcds
	ifOutOctets	ipFragOKs	IcmpOutParmProbs
	ifOutUcastPkts	ipFragFails	IcmpOutSrcQuenchs
	ifOutNUcastPkts	ipFragCreates	IcmpOutRedirects
	ifOutDiscards	ipAdEntAddr	IcmpOutEchos
	ifOutErrors	ipAdEntIfIndex	IcmpOutEchoReps
	ifOutQLen	ipAdEntNetMask	IcmpOutTimestamps
	ifSpecific	ipAdEntBcastAddr	IcmpOutTimestampReps
		ipAdEntReasmMaxSize	IcmpOutAddrMasks
		IpNetToMediaIfIndex	IcmpOutAddrMaskReps
		IpNetToMediaPhysAddress	
		IpNetToMediaNetAddress	
		IpNetToMediaType	
		IpRoutingDiscards	

UDP MIB	TCP MIB	SNMP MIB
UdpInDatagrams	tcpRtoAlgorithm	snmpInPkts
UdpNoPorts	tcpRtoMin	snmpOutPkts
UdpInErrors	tcpRtoMax	snmpInBadVersions
UdpOutDatagrams	tcpMaxConn	snmpInBadCommunityNames
UdpLocalAddress	tcpActiveOpens	snmpInASNParseErrs
UdpLocalPort	tcpPassiveOpens	snmpInTooBigs
	tcpAttempFails	snmpInNoSuchNames
Address Translation MIB	tcpEstabResets	snmpInBadValues
AtIfIndex	tcpCurrEstab	snmpInReadOnlys
AtPhysAddress	tcpInSegs	snmpInGenErrs
AtNetAddress	tcpOutSegs	snmpInTotalReqVars

Address Translation MIB	TCP MIB	SNMP MIB
AtNetAddress	tcpRetransSegs	snmpInTotalSetVars
	tcpConnState	snmpInGetRequests
	tcpConnLocalAddress	snmpInGetNexts
	tcpConnLocalPort	snmpInSetRequests
	tcpConnRemAddress	snmpInGetResponses
	tcpConnRemPort	snmpInTraps
	tcpInErrs	snmpOutTooBigs
	tcpOutRsts	snmpOutNoSuchNames
		snmpOutBadValues
		snmpOutGenErrs
		snmpOutGetRequests
		snmpOutGetNexts
		snmpOutSetRequests
		snmpOutGetResponses
		snmpOutTraps
		snmpEnableAuthenTraps

RFC1317: RS-232 MIB objects

Generic RS-232-like Group	RS-232-like General Port Table	RS-232-like Asynchronous Port Group
rs232Number	rs232PortTable	rs232AsyncPortTable
	rs232PortEntry	rs232AsyncPortEntry
	rs232PortIndex	rs232AsyncPortIndex
	rs232PortType	rs232AsyncPortBits
	rs232PortInSigNumber	rs232AsyncPortStopBits
	rs232PortOutSigNumber	rs232AsyncPortParity
	rs232PortInSpeed	
	rs232PortOutSpeed	

The Input Signal Table	The Output Signal Table
rs232InSigTable	rs232OutSigTable
rs232InSigEntry	rs232OutSigEntry
rs232InSigPortIndex	rs232OutSigPortIndex
rs232InSigName	rs232OutSigName
rs232InSigState	rs232OutSigState

D

Service Information

This appendix shows you how to contact Moxa for information about this and other products, and how to report problems.

In this appendix, we cover the following topics.

- **MOXA Internet Services**
- **Problem Report Form**
- **Product Return Procedure**

MOXA Internet Services

Customer satisfaction is our number one concern, and to ensure that customers receive the full benefit of our products, Moxa Internet Services has been set up to provide technical support, driver updates, product information, and user's manual updates.

The following services are provided

E-mail for technical support ..... service@moxa.com.tw

World Wide Web (WWW) Site for product information:

..... http://www.moxa.com or

..... http://www.moxa.com.tw

Problem Report Form

MOXA NPort 5400 Series

Customer name:	
Company:	
Tel:	**Fax:**
Email:	**Date:**

1. **Moxa Product:** ☐ NPort 5410 ☐ NPort 5430 ☐ NPort 5430I
2. **Serial Number:** _____

Problem Description: Please describe the symptoms of the problem as clearly as possible, including any error messages you see. A clearly written description of the problem will allow us to reproduce the symptoms, and expedite the repair of your product.

Product Return Procedure

For product repair, exchange, or refund, the customer must:

- Provide evidence of original purchase.
- Obtain a Product Return Agreement (PRA) from the sales representative or dealer.
- Fill out the Problem Report Form (PRF). Include as much detail as possible for a shorter product repair time.
- Carefully pack the product in an anti-static package, and send it, pre-paid, to the dealer. The PRA should be visible on the outside of the package, and include a description of the problem, along with the return address and telephone number of a technical contact.